the OIL AND GAS JOURNAL

DOUBLE THE VALUE OF YOUR TOOL JOINT DOLLAR

Hughes Flash-Weld Tool Joints are built to outlast the life of the drill pipe . . . the Hughes unitized construction automatically eliminates pipe end troubles such as last engaged thread failures, "wobbles," thread corrosion, etc. The reliability and rugged construction embodied in the Hughes hardfaced Flash-Weld Tool Joint provide the "Engineered Solution" to eliminate time, trouble, and expense of replacing worn joints.

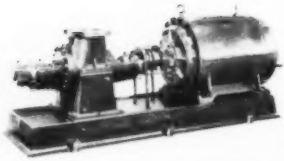
HUGHES
TOOL COMPANY
HOUSTON, TEXAS
WORLD STANDARD
OF THE INDUSTRY

PRICE 50 CENTS

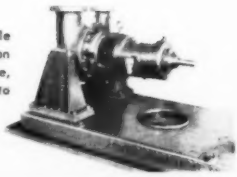
TABLE OF CONTENTS PAGE 71

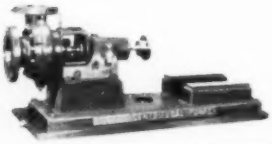
AUGUST 25, 1949

DVS-HF SERIES *(right)*
One or two stages, vertically split casing, for hot service. Capacities to 4,000 gpm, tdh to 700′, temperatures to 900° F.



TC SERIES *(right)*
Vertically split, saddle mounted, end suction optional, 1 or 2 stage, tdh to 1200′, 1½″ to 4″.





ES SERIES *(above)*
End suction—simple, rugged, dependable. 1½″ to 10″, heads to 450′, temperatures to 800° F.

Every UNITED PUMP *fits its Job*

VLT SERIES *(left)*
Vertical counterpart of TC series. Space saver for refinery service. 1½″ to 4″, to 1200 gpm, tdh to 700′, lower npsh, temperatures to 800° F.

To engineer and build each pump for its particular job, United maintains unusual flexibility in its complete engineering and manufacturing facilities. Thus, design and metallurgy are tailored to needs—at lowest possible cost. United engineers are not required to adapt existing models to new needs except when those models offer highest obtainable efficiency under specified conditions. As a result of this policy, United's basic designs reflect the latest in hydraulic engineering, tempered with the practical experience of over a quarter of a century of specialized service to the oil industry. That's why United Centrifugal Pumps have proved their efficiency and dependability for every type of service—from pipeline to processing. Specify UNITED—with confidence.

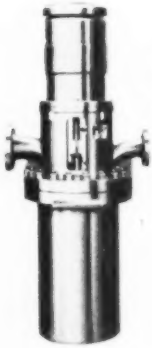
VCD SERIES *(right)*
Vertical pumps specifically designed for refinery service. Fewer stages, less wearing parts than standard design. 125′ to 200′ tdh per stage at 1750 rpm. Capacities to 10,000 gpm. Radially and axially balanced eliminating thrust on motor bearings.

UNITED CENTRIFUGAL PUMPS

Division of United Iron Works
Since 1880

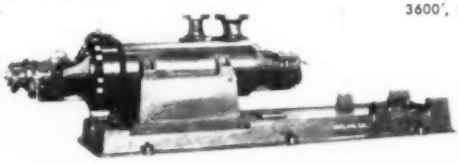
Main Offices and Plants • OAKLAND, CALIFORNIA

Sales Offices • LOS ANGELES • HOUSTON • TULSA
ST. LOUIS • CHICAGO • CLEVELAND • NEW YORK

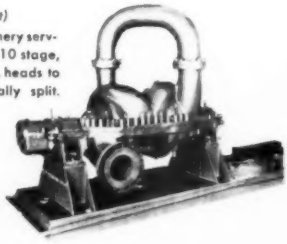


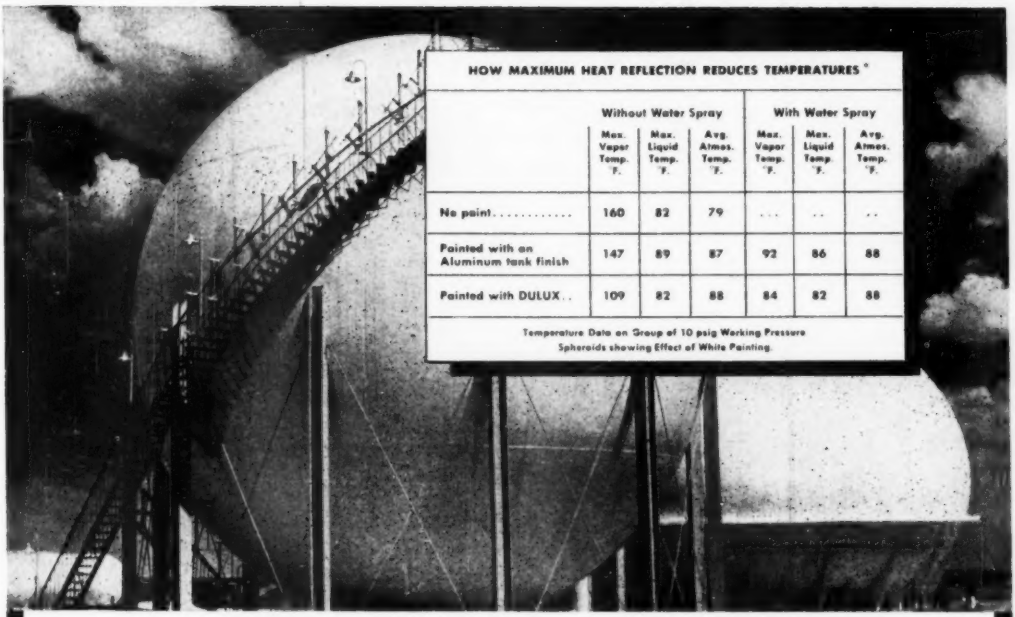
VMS SERIES *(left)*
dp to 3000 psi, 50 to 350 gpm, 1st stage at bottom, adaptable to any npsh, double volutes for radial balance, opposed impellers for axial balance. For refinery and process service.

HO SERIES *(below)*
For hot charge to 900° F., to 3000 psi. Double case, double volute.



MS SERIES *(right)*
Pipe line and refinery service designs. 2 to 10 stage, fluids to 600° F., heads to 3600′, horizontally split.





HOW MAXIMUM HEAT REFLECTION REDUCES TEMPERATURES*

	Without Water Spray			With Water Spray		
	Max. Vapor Temp. °F.	Max. Liquid Temp. °F.	Avg. Atmos. Temp. °F.	Max. Vapor Temp. °F.	Max. Liquid Temp. °F.	Avg. Atmos. Temp. °F.
No paint.....	160	82	79	...	..	..
Painted with an Aluminum tank finish	147	89	87	92	86	88
Painted with DULUX..	109	82	88	84	82	88

Temperature Data on Group of 10 psig Working Pressure Spheroids showing Effect of White Painting.

Du Pont DULUX Tank White

REG. U. S. PAT. OFF.

pays its own way . . . and more!

You can readily see why Du Pont DULUX Tank White is fast becoming the favorite tank finish in the petroleum industry when you study the chart above. It shows how the superior heat-reflecting ability of DULUX *lowers* interior tank temperatures . . . and thereby *minimizes* heavy evaporation losses in warm weather.

Using DULUX pays other dividends, too. DULUX provides unusually high resistance to premature corrosion, common fumes and industrial gases. DULUX means low repaint costs because less extensive surface preparation is required. And through its self-cleaning feature, DULUX stays white . . . gives *years* of maximum heat reflection!

To get long-term protection at low maintenance cost . . . to preserve the quantity and quality of your product at its peak . . . finish with Du Pont DULUX Tank White!

READ HOW *Du Pont DULUX Tank White can save you money two important ways. Send coupon today for "BEAT THE HEAT," an informative booklet complete with charts and other technical data on DULUX.*

Send for Free Booklet Today!

*Table from National Petroleum News, Technical Section

E. I. du Pont de Nemours & Co. (Inc.)
Finishes Div., Dept. O-98 Wilmington 98, Delaware.

Please send, free of charge, your new illustrated booklet **"BEAT THE HEAT."**

*Name*_____ *Title*_____

*Firm*_____

*Address*_____

*City*_____ *State*_____

DU PONT
REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

The Oil and Gas Journal, published Thursdays by The Petroleum Publishing Company. Entered as second-class matter at post office at Tulsa, Okla., under act of March 3, 1879. U. S. and foreign rates to the petroleum industry, $3 yearly. Copyright 1949

Positive Performance with Fairbanks-Morse Rotary Pumps!

Simple, compact Fairbanks-Morse Rotary Pumps have a positive pumping action...a steady flow that minimizes vibration and shock...assures long, low-cost service.

With only two moving parts, these positive-displacement pumps provide efficient, economical pumping of any free-flowing liquid. There are no complicated parts to cause trouble or to require frequent adjustment and maintenance. Capacities range from 1.3 to 450 g.p.m. If you're interested in low-cost pumping, see your Fairbanks-Morse Pump Distributor or branch pump engineer. Fairbanks, Morse & Co., Chicago 5, Ill.

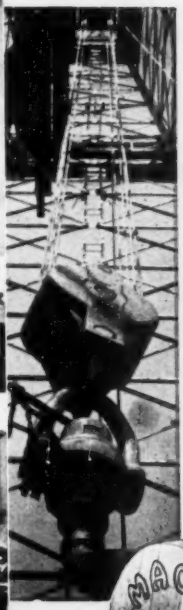
FAIRBANKS-MORSE

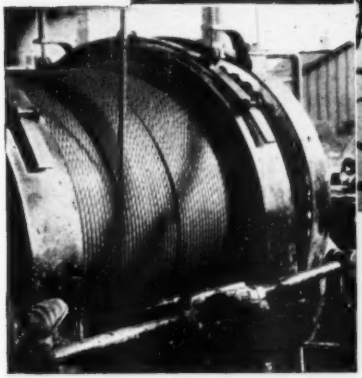
A name worth remembering

OIL FIELD EQUIPMENT • DIESEL LOCOMOTIVES • DIESEL ENGINES • PUMPS • SCALES
MOTORS • GENERATORS • STOKERS • RAILROAD MOTOR CARS and STANDPIPES • FARM EQUIPMENT • MAGNETOS

Macwhyte PREformed Rotary Lines

Correct for your drilling equipment





For maximum safety, service, dependability, use Macwhyte PREformed Monarch Whyte Strand Rotary Lines.

It's PREformed for flexibility, easy handling and maximum service. It runs smoothly through blocks and spools evenly on drum.

Internal Lubrication covers every wire in the line . . . protecting unseen inside wires. Monarch Whyte Strand PREformed Rotary Lines are available in the size and length you need. Macwhyte Distributors and Mill Depots — carry stocks for immediate delivery. Macwhyte representatives will recommend the correct line for your equipment.

MACWHYTE COMPANY

2916 Fourteenth Avenue · Kenosha, Wisconsin

Manufacturers of Internally Lubricated Wire Rope, Braided Wire Rope Slings, Aircraft Cables and Assemblies.

Mill Depots: New York · Pittsburgh · Chicago Minneapolis · Fort Worth · Portland · Seattle San Francisco · Los Angeles

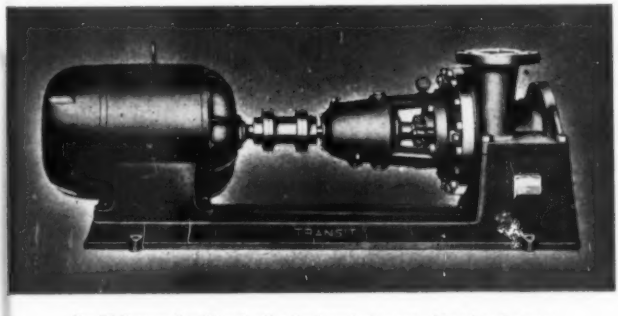
Distributors throughout the U. S. A. and other countries.

Other Macwhyte Wire Lines for the oil industry:

Cable Tool Lines
"Hi-Lastic" Lines
Casing, Tubing Lines
Winch Lines
Sand, Bailing Lines
Braided Wire Rope Slings
Monel Metal and Stainless Steel Wire Ropes

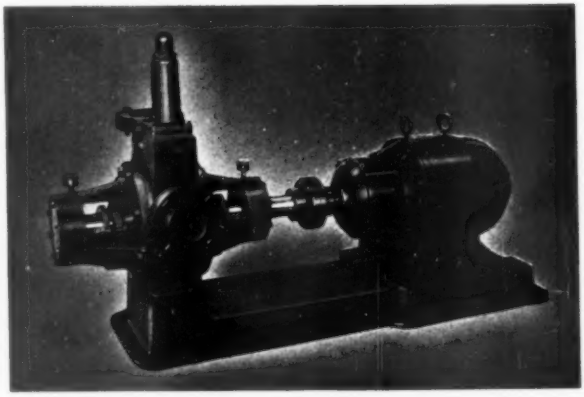
TRANSIT PUMPS
-leading their fields

In refinery, pipeline and oil field services, TRANSIT PUMPS are leaders—the result of 70 years experience in designing and building pumps for the Oil Industry.



The ES Process Centrifugals offer the broadest range of head and capacity available in a single line of process pumps. Unexcelled performance in toughest services. Ask for bulletin 6000.

Transit's *full line* includes a reciprocating, centrifugal or rotary pump for virtually every application, and Transit representatives are ready to specify the type and size for your particular requirement.



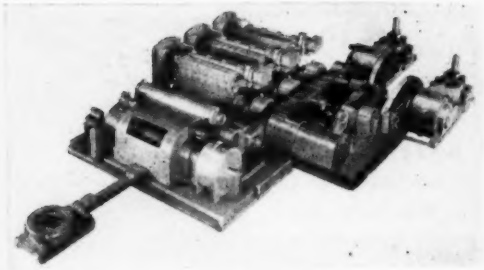
Six models of Rotary Pumps cover widely varying applications. Especially popular as oil field gathering line and refinery transfer pumps and as cargo and bilge pumps in marine service. Ask for bulletin 7051.

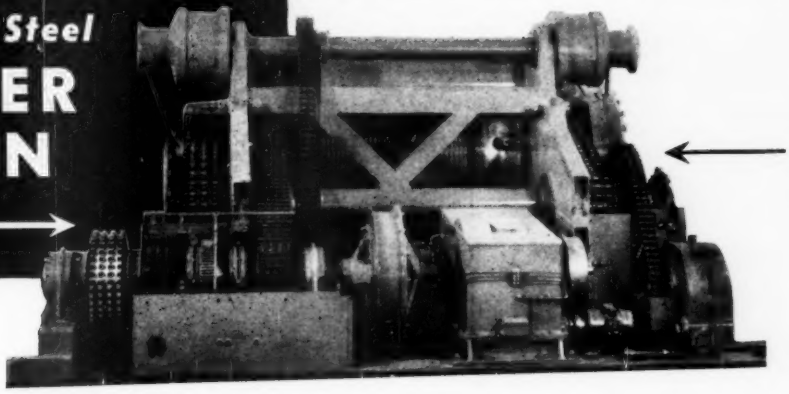
NATIONAL TRANSIT PUMP AND MACHINE CO.

Home Office and Works, OIL CITY, PENNA.

CHICAGO, 624 South Michigan Ave. • CLEVELAND, 702 Marshall Building • HOUSTON, Room 522 West Building • NEW YORK, 30 Rockefeller Plaza • PHILADELPHIA, 2324 Fidelity Plaza Trust Building PITTSBURGH, 812 Empire Bank Building • TULSA, 210 East Archer • LOS ANGELES, 2049 East 37th Street

SUPERIOR
Breaks Record Again
Rig Equipped with
LINK-BELT
Precision Steel
ROLLER CHAIN





20,521-ft. deep world record breaking Superior Oil Company's Pacific Creek #1 Well was completed in July, 1949. National Supply Co.'s Ideal #160 Rig used on this well is equipped throughout with Link-Belt Precision Steel Roller Chain.

The industry's largest power rig, used on this well, was built especially for drilling tomorrow's deeper holes, and this record well, proves that Link-Belt Precision Steel Roller Chains have what it takes to handle the most difficult of power transmission jobs.

The 2000 H.P., developed by this rig's three engines is compounded through Link-Belt roller chain. Power transmission for the drawworks is equally reliable as a result of dependable Link-Belt chain drives. This rig's two slush-pumps are positively driven with dependable Link-Belt roller chain.

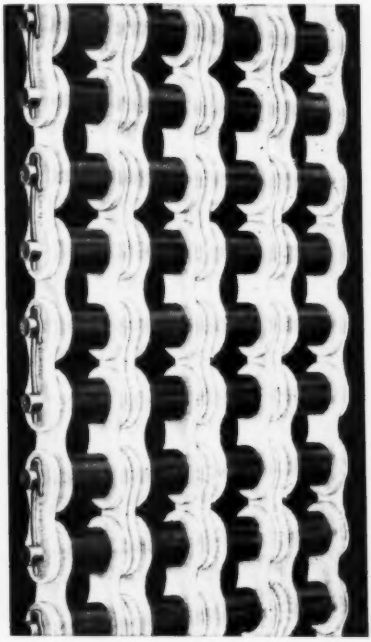
Our engineers will be glad to assist you in solving any power transmission job, without obligation. Just telephone or write us.

➢ E-Z-ASSEMBLY ≺

Link-Belt engineers have developed a construction that makes assembly and disassembly of multiple width chains in the field much easier. With this feature, load distribution across the width of the chain is maintained.

LINK-BELT COMPANY

Indianapolis 6, Dallas 1, Houston 1, Kansas City 6, Mo., Los Angeles 33, New York 7, Toronto 8.
Offices in Principal Cities. 11.6(1)



LINK BELT
Precision Steel
ROLLER CHAIN

OIC VALVES
are installed at
ESSO
BAYWAY PLANT
Esso Standard Oil Co.
Plant, Linden, N. J.

Another Installation where

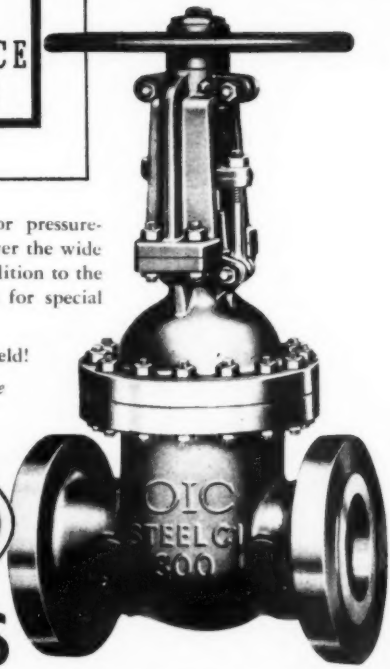
OIC
SETS THE PACE
IN VALVES

THERE'S a growing demand for OIC Valves in the petroleum field. The job of directing and controlling America's most precious fluids demands valves that function with absolute precision and safety for long periods of time.

Recognizing this, OIC selects materials, both for trim and for pressure-containing parts, with the utmost consideration for their utility over the wide range of applications for which the valves are recommended. In addition to the standard trim materials, special trims and combinations of trims for special application are available.

Advanced design features make OIC Valves *pace-setters* of the field!

See Your OIC Distributor for Prompt, Efficient Service



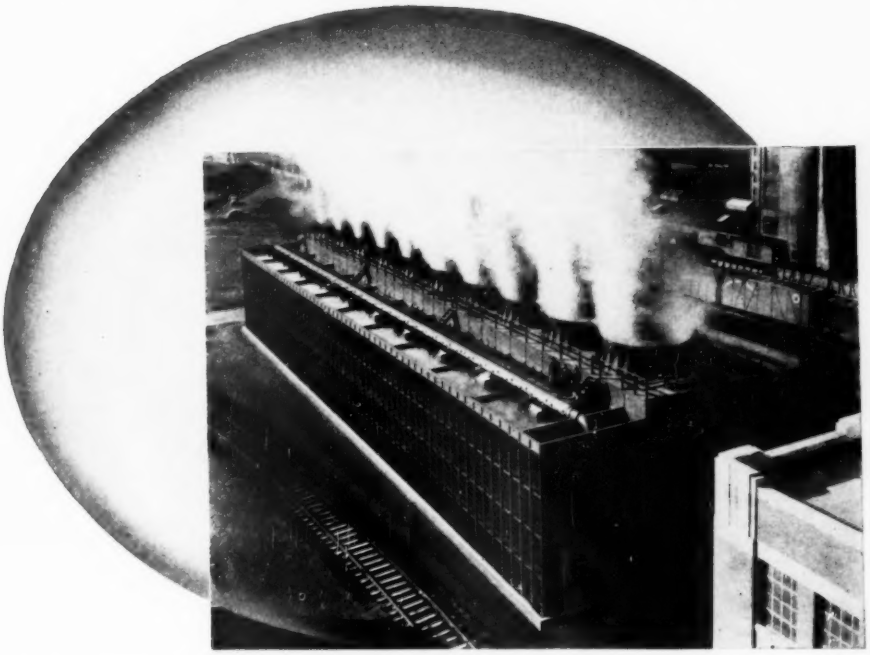
GET YOUR FREE COPY OF THE FAMOUS OIC CROSS REFERENCE CHART!

Eliminate your valve replacement problems with the OIC Cross Reference Chart. Simply check the number of the valve on the line, turn to the chart, and find the correct OIC Valve to replace it. Send your request to *The Obio Injector Company, Wadsworth, Ohio.*

OIC
VALVES
STEEL • IRON • BRONZE

0-249-16

Double-Flow MARLEY Double Efficiency



GIVES LOW COST WATER COOLING

Marley DOUBLE-FLOW Cooling Towers, using the practical, effective, CROSS-FLOW design (air across, water down) is the ultimate in Cooling Tower efficiency.

Only Double-Flow Cooling Towers offer outstanding, exclusive features such as:

1. **OPEN DISTRIBUTION SYSTEM** . . . On top of the tower, in plain view, easy to inspect, regulate and clean.
2. **NO DEAD AIR POCKETS** . . . Every drop of water meets a steady flow of air as it splashes down thru Marley's patented nail-less filling.
3. **BETTER MECHANICAL EQUIPMENT** . . . Equipped with Marley engineered and Marley made fans, fan cylinders, drive shafts and Geareducers . . . your assurance of top quality.
4. **SOUND STRUCTURES** . . . Double-Flows have withstood hurricanes, earthquakes and corrosive atmospheres because all lumber, hardware, supports, bracing and columns are designed to make an engineered structure.
5. **COMPLETELY SAFE OPERATION** . . . Stairways, handrails, walkways, and fan cylinders insure safe operation and maintenance in any kind of weather.
6. **MINIMUM DRAFT LOSS** . . . Drift eliminators set in slanting position allow greater area for air passage, minimizing draft loss and reducing horsepower requirements.
7. **GREATER COOLING CAPACITY** . . . Packed with decks of nail-less filling, Double-Flows have larger, wetted surface therefore greater cooling capacity.

If you want to improve water cooling efficiency and reduce water cooling costs in your plant, it will pay you to ask a MARLEY "Double-Trained" Application Engineer to tell you all about the DOUBLE-EFFICIENCY of the MARLEY DOUBLE-FLOW. No cost or obligation.

MARLEY COOLING TOWERS

THE MARLEY COMPANY, INC. • KANSAS CITY 15, KANSAS

BEND IT

COIL IT

HANDLE IT ROUGH

GOODALL

FLEXO

LONG LIFE Rotary Hose

is built

to take it

Your rewards for specifying Goodall Flexo Rotary Hose are longer hose life, greater ease of handling and lower hose costs.

That is because Goodall Long Life Flexo Rotary Hose is made on a completely different construction principle that does not depend on tightly wrapped wires for strength.

That construction principle puts Goodall in a class by itself.

It is the only hose that is strong enough to withstand normal whipping from mud pump surge, and at the same time is flexible enough to be shipped in 63″ crates.

Ease of handling is another "plus" benefit of Goodall Flexo hose. It is so flexible and light in weight that all you have to do is loop it into a manageable sized coil and transport it . . . the only precaution necessary is to protect from being crushed or cut by heavy equipment.

You save money too because Goodall Flexo Hose, with Barney Coupling, greatly outlasts ordinary rotary hose.

Unique also, is the complete repair department maintained by the Goodall Rubber Company, for the convenience of Goodall Rotary Hose customers. This service, plus the many advantages of Goodall Flexo Rotary Hose, makes Goodall the favorite of drillers all over the world.

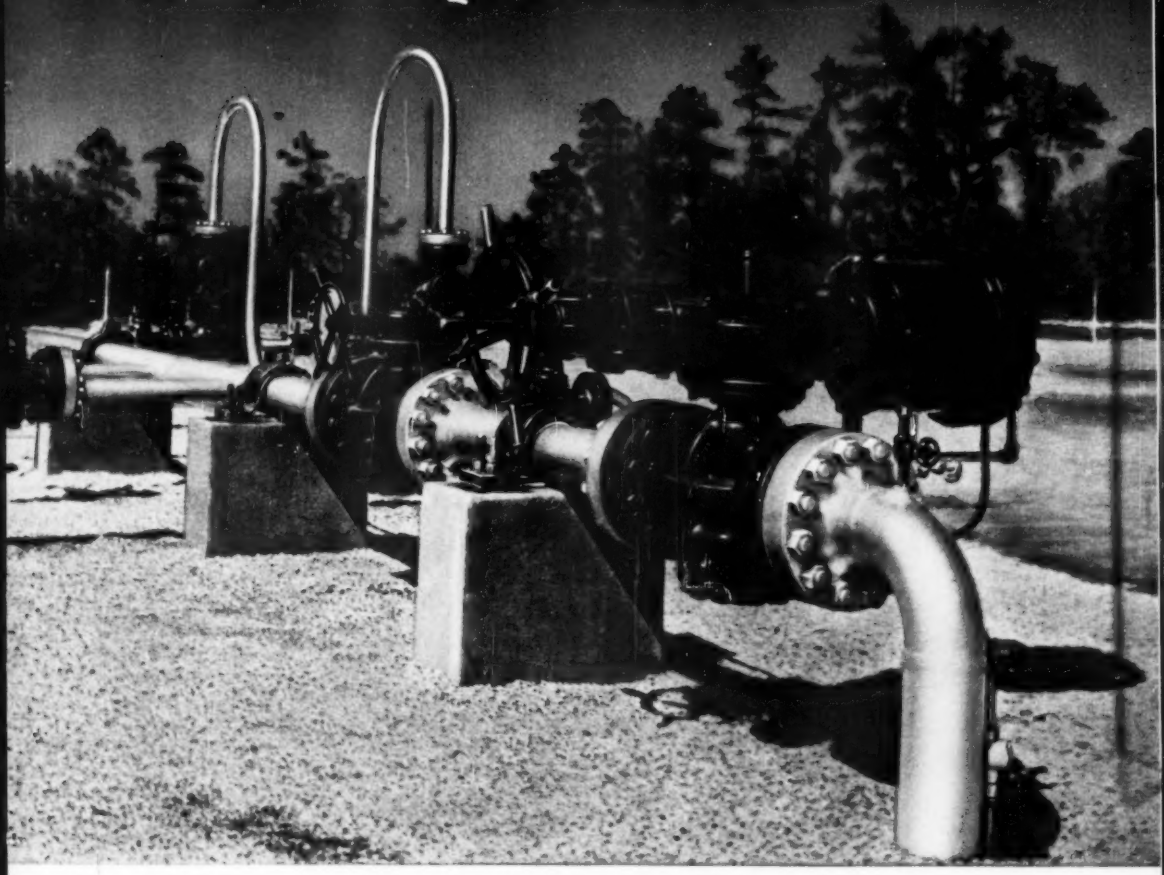
Because of these outstanding features, Goodall Flexo Rotary Hose has long been the favorite of drilling contractors and leading oil companies all over the world.

To get even longer service from your Goodall Rotary Hose, use a swing joint between the standpipe and hose. The extra long service you get from the swing joint installation will reduce hose costs almost to the vanishing point.

GOODALL RUBBER COMPANY — TRENTON, N. J.

REMOTE CONTROL

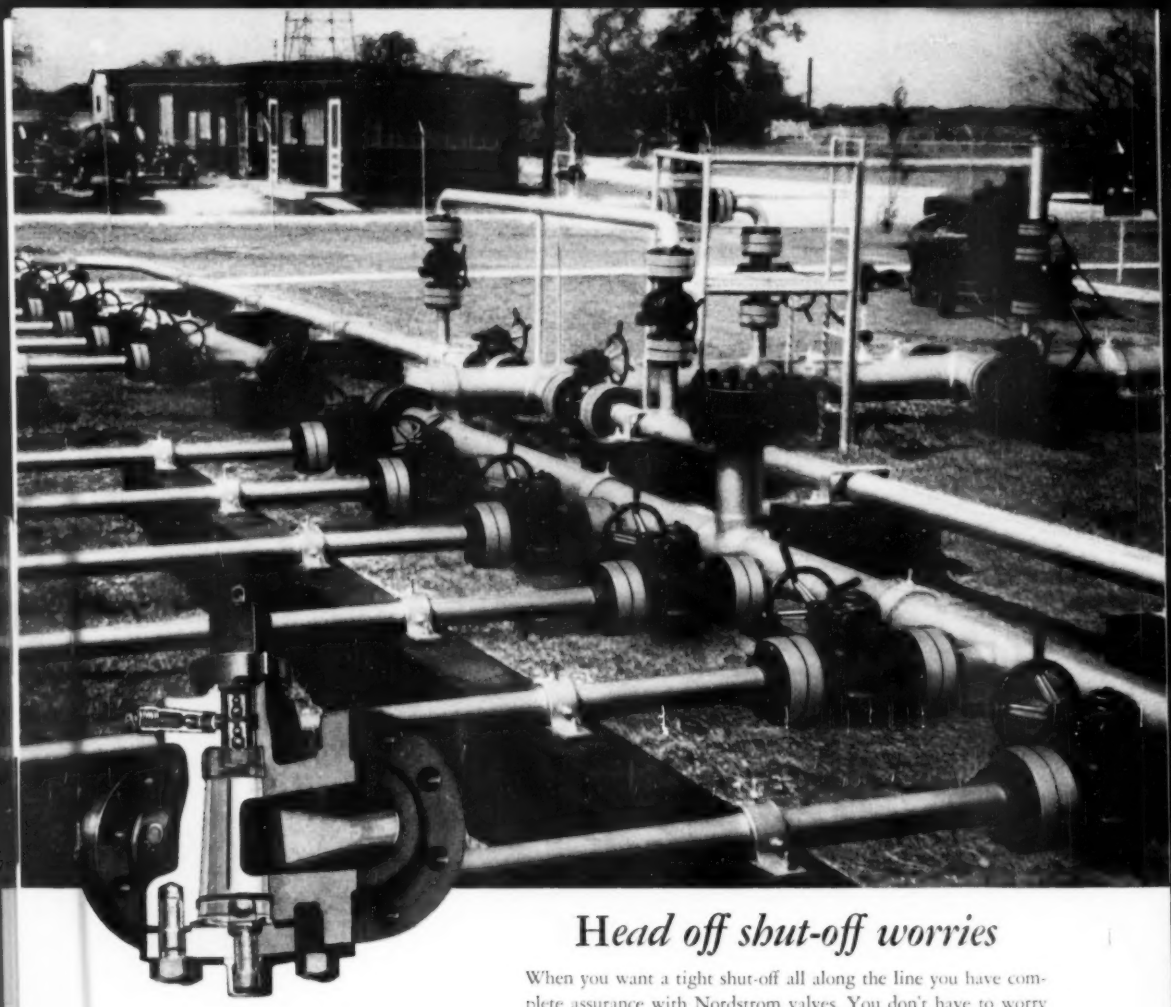
made simple, safe and sure



Promoting increased efficiency in valve operation

Panelboard operation of distant valves is becoming more and more an essential convenience and a factor of greater operating safety. One central operator can be responsible for any number of valves. There's no delay in going from valve to valve, some of which may be located at great distance. Emergency shut-offs and frequent routine operation can be instantly made with Nordstrom cylinder operated valves. Their lubricated plug and simple, quarter-turn make them best adaptable to cylinder operation. Can be operated with air, gas, oil or water. In many cases, fluid in the main piping system may be used as the operating medium. Automatic shut-off for river crossings and main transmission lines is provided. Cylinder operating pressures range from 50 to 200 lb. When planning future installations, give consideration to panelboard control for increased efficiency and saving in man-hours. Nordstroms identify well-engineered plants.

Nordstrom **LUBRICATED VALVES**
Cylinder operated



NORDSTROMS IDENTIFY WELL-ENGINEERED PLANTS

•

KEEP UPKEEP DOWN

Use only genuine Nordcoseal lubricants

Head off shut-off worries

When you want a tight shut-off all along the line you have complete assurance with Nordstrom valves. You don't have to worry about dust, abrasives or suspensions in the line fluid interfering with valve closure. The Nordstrom rotary plug, sliding on its protected lubricant seat, closes sleeve-like instead of depending upon an imposed thrust against an exposed seat. Pressurized "Sealdport" lubrication surrounding each port prevents leakage internally and externally. This is valve engineering at its best; valve operation so positive, so sure, that no other means of line control can equal it.

Nordstrom

LUBRICATED ROCKWELL VALVES

Sealdport Lubrication

NORDSTROM VALVE DIVISION—***Rockwell Manufacturing Co.***— 400 No. Lexington Ave., Pittsburgh 8, Pa.

Atlanta • Boston • Chicago • Houston • Kansas City • Los Angeles • New York • Pittsburgh • San Francisco • Seattle • Tulsa • and leading Supply Houses

Export: Rockwell International Corporation, 7701 Empire State Bldg., New York 1, N. Y.

cut threads

BETTER FASTER CHEAPER

1. LANDIS DIE HEADS cut tool cost by using chasers that are independent units. Worn or damaged chasers are reground or replaced *individually*, without affecting the remaining chasers of the set.

2. LANDIS DIE HEADS reduce tool inventories by cutting *both* right- and left-hand threads with a *single* set of chasers. Chasers are ground on both ends, the spring action in the die head is reversed, and either a right-hand or left-hand set of chaser holders is used.

3. LANDIS DIE HEADS cut all diameter threads with a constant pitch and form within the rated range of the die head with a *single* set of chasers. Short thread lengths larger than the rated diametrical range can be cut with the *same* die head equipped with over-size chaser holders.

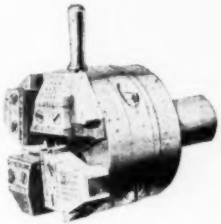
4. LANDIS DIE HEADS use chasers that can be reground to 80% of their length. Regrinding is a simple operation restoring the entire cutting edge and leading feature, yet retaining the initial accuracy of pitch, diameter, and depth of cut.

5. LANDIS DIE HEADS improve thread finish and cut production costs by reducing chaser wear and breakage. The tangential position of the chaser to the work allows lateral absorption of cutting strains. Resulting reduced friction and vibration make higher cutting speeds possible without causing thread distortion or chaser breakage.

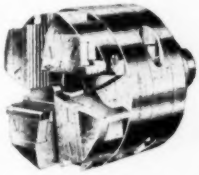
6. LANDIS DIE HEADS consistently produce threads accurate for lead. Regrinding does not destroy the lead controlling feature of the chasers. Thus this feature assures accurate pitch threads throughout the chaser's life.

7. LANDIS DIE HEADS are built to stay on the production line. Tough, high-carbon steel is used in all parts. Rigid construction maintains accuracy, and minimizes wear of working parts. Landis Die Heads are furnished in two models, heat-treated or hardened-and-ground, depending on the application and quality of thread desired.

LANCO—a revolving die hand for hand-operated, semi-automatic, and automatic threading machines.



LANDMATIC—a stationary die head with self-opening action for turret lathes.



LANDEX—a revolving die head for automatic screw machines and other "live spindle" machines.

LANDIS *Machine* COMPANY

WAYNESBORO · PENNA.

Represented in the Domestic Oil Fields by: Colcord-Wright Machinery & Supply Co., St. Louis, Mo.; C. J. Hartec Machinery, Houston, Texas; Frederic-Baker Co., New Orleans, La.; Moore Machinery Co., Los Angeles and San Francisco, Calif.; Hendrie & Bolthoff Mfg. & Supply Co., Denver, Colo.

never need external power

***FREE BOOKLET** tells the simple story of Alcoa Pipe-line Protection*

In ten minutes reading time, Alcoa's new 8-page booklet tells the exceptional economy of an Alcoa buried anode system for pipe-line protection. Your nearby Alcoa sales office will gladly supply sufficient copies for your organization.

With Alcoa Magnesium Anodes, corrosion control for your pipe lines need not be confined to locations where power is available. A simple system of Alcoa buried anodes generates its own current, exclusive of any external source. You benefit many ways. Installation and maintenance are low with anode protection. Storms do not interfere with this constant protection. You get a more uniform, blanket-type corrosion control over the entire line that requires less total current.

Ask your nearby Alcoa sales office for copies of booklets to help explain Alcoa cathodic protection to all interested members of your organization. Or write to ALUMINUM COMPANY OF AMERICA, 625 Gulf Building, Pittsburgh 19, Pennsylvania.

MAGNESIUM

ANODES by ALCOA

ALCOA
ALUMINUM

speed →

safety →

economy →

ruggedness →

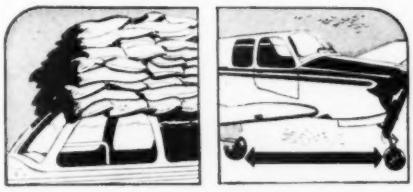
comfort →

. . . combined for greater value in the

Beechcraft BONANZA

Speed! With a top speed at sea level of 184 miles per hour (performance figures guaranteed), at 8,000 feet the Beechcraft Bonanza cruises at 170 mph using only 56% of engine's maximum rated take-off power. *No engine overload*, so you get extra speed with an extra margin of safety.

Safety! Rated in the *utility* category at *full gross weight*, with a limit flight load factor of 4.4 G's, the Beechcraft A35 Bonanza has been subjected successfully to special, additional tests not required by CAA. Sturdy framework is the secret.



Ruggedness! Just for example, check the low and sturdy landing gear, with its wide tread and long wheel base, and struts exclusively cross-braced. Nose gear position plus long wheel base eliminate pitching, allow greater braking without excessive nose wheel load.

Economy! This Beechcraft has a fuel consumption of only 9½ gallons per hour at cruising speed. It carries four people and more than 135 pounds of baggage at a seat-mile cost of as low as 1¼ cents. You get the *extra speed* you want plus this important *extra economy*.

Comfort! The unique retractable step preserves feminine dignity. The wide sedan-type door and folding front seat help make getting in and out of this Beechcraft as easy as the family car. Plenty of room to stretch out; cabin really sound-proofed.

These are only a few of the reasons why the Beechcraft Bonanza is a better buy! *See* it today! A note on your company letterhead will bring illustrated brochures describing the Beechcraft Bonanza's many *extra* advantages. Write to Beech Aircraft Corporation, Wichita, Kansas, U. S. A.

Compare these performance features	Compare these comfort features
Top speed, 184 mph	Exclusive retractable step
Cruising speed, 170 mph	Limousine entrance
Range, 750 miles	Insulated, sound-proofed cabin
Service Ceiling 17,100 feet	Quickly removable rear seat
Fuel economy, 9½ gal. per hour	Luggage compartment accessible two ways

Beechcraft BONANZA MODEL A35

BEECHCRAFTS ARE THE AIR FLEET OF AMERICAN BUSINESS

NEW HIGHER POWER

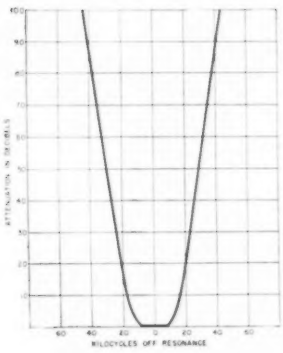
The new RCA FLEETFONE is a mobile communication equipment designed to meet the special requirements of the 30-50 mc band. The FLEETFONE provides not only for the longer distances common on 30-50 mc and the higher power usually required, but also introduces a new high degree of compactness and installation convenience.

New "Sandwich" assembly

Compact "Sandwich" Construction. Within this ultra-compact housing is contained the complete transmitter, receiver, and power supply. The single-package "Sandwich" construction takes the difficulty out of installation. Simply bolt the base to the desired surface in the desired position. Insert the chassis. Fasten the cover. Connect the cables. It's as simple as that.

Mounting Versatility. The FLEETFONE is designed for mounting in practically any location or position. It may be mounted on its bottom, side, or attached to a vertical surface. This is especially important to operators of large fleets of vehicles of various types. The FLEETFONE is just as much at home in an automobile, a light pick-up, or a ten-ton trailer-truck.

30 or 60 Watts Output. In order to meet the coverage requirements of your particular area, the FLEETFONE gives you a choice of either 30 or 60 watts of transmitter output. In both cases, it's the same size, single-package unit.



"CANYON-CURVE" SELECTIVITY

6- or 12-Volt Operation. The 6-volt FLEETFONE is standard equipment for general, mobile application. In addition, many mobile vehicles, such as trucks, fire engines, etc. use a 12-volt battery. In these vehicles the 12-volt FLEETFONE (30 watts) eliminates the need for power-wasting, voltage dropping resistors, or the necessity to impose too heavy a drain on half of the battery.

Extra Features. "Canyon-Curve" Selectivity protects you against interference from stations on neighboring channels. The exclusive "Transducer Modulator Control" maintains a constant modulation level whether you whisper or shout into the microphone. High receiver sensitivity assures reliable reception at extreme distances and in the roughest terrain.

GET THE COMPLETE FACTS:

DEPARTMENT 122H
RCA ENGINEERING PRODUCTS
CAMDEN, NEW JERSEY

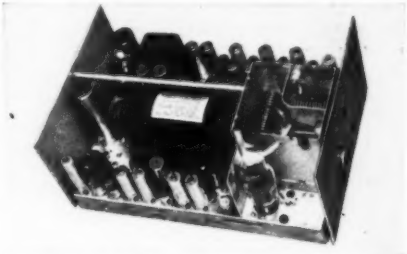
Gentlemen: Send me the free brochure telling all about the All-New RCA FLEETFONE.

Name_____

Address_____

City_____

State_____



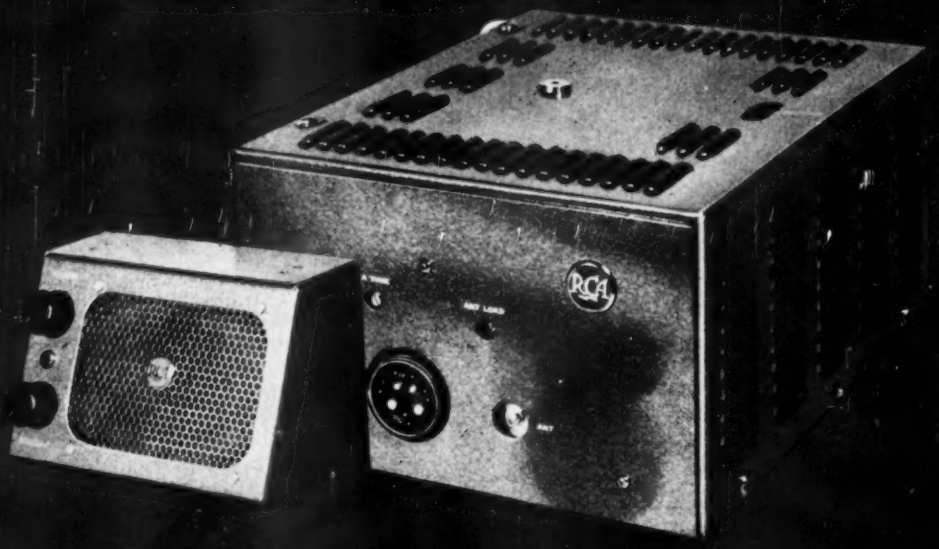
Inside view of the 30-watt FLEETFONE showing transmitter portion (foreground) dynamotor and receiver (background).

WITH SMALLER SIZE-

The RCA FLEETFONE

30-50 Mc

MOBILE 2-WAY RADIO



The complete FLEETFONE, including transmitter-receiver, control unit-loudspeaker, and handy palm-type microphone.

MOBILE COMMUNICATIONS SECTION

RADIO CORPORATION of AMERICA

ENGINEERING PRODUCTS DEPARTMENT, CAMDEN, N.J.

In Canada: RCA VICTOR Company Limited, Montreal

Hustle— or MUSCLE..

LORAINS Give you BOTH!

Here are two widely different types of work in the Petroleum Industry . . . but both are benefitting from Lorain performance.

At the top, a Lorain Moto-Crane of Magnolia Petroleum Co. removes a condenser at their Beaumont, Texas, oil refinery. Here's a job that calls for muscle and accuracy — and the Lorain gives them both. It has plenty of "hustle" too, because of its rubber-tire mounting which enables it to move from job to job at speeds up to 30 M.P.H.

The lower photo shows a cross-country pipe line job in hilly terrain with plenty of tough digging. Again it's a Lorain—a TL Hoe—that's providing the muscle to carve out the trenches.

These are good examples of the wide range of uses for Lorain "Hustle and Muscle" in the petroleum field . . . no matter what the job, the location, or the material. Ask your Thew-Lorain distributor how a Lorain can serve your needs—and do it soon!

THE THEW SHOVEL CO., LORAIN, OHIO

Here's Hustle

At the Beaumont, Texas, refinery of Magnolia Petroleum Co. a Lorain Moto-Crane uses a 50 ft. boom to remove an 8 ton Ammonia Condenser (16' x 3' dia.)

Here's MUSCLE..

Digging trenches, through tough going and across hilly southern Ohio means setting a fast pace to stay ahead of the pipe crew—that's why a Lorain TL Hoe got the job.

Send for NEW Oil Field Folder

THE THEW SHOVEL CO.
LORAIN, OHIO
Please send copy of new folder entitled "Cost Cutters of the Petroleum Industry"

Name _____ Title _____
Company _____
Address _____ State _____
City _____

1905 THEW-LORAIN 1955 50th ANNIVERSARY

THEW® Lorain

SHOVELS • CRANES • CLAMSHELLS
DRAGLINES • HOES • MOTO-CRANES

CORROSION COSTS INDUSTRY

$6,000,000,000.00

ANNUALLY!

How much do you pay?

Don't risk needless waste

If all corrosion were as obvious as it is in steel pipe, industry would do more about it. But it is not. Often hidden or unnoticed – indoors and outdoors, above ground and below ground – corrosion takes its daily toll. Acids, alkalis, salts, gases and atmospheric conditions all are contributing factors. As a result, industry pays a terrific bill for corrosion – far more than it should. Your own cost, too, may be greater than necessary. Minimize your risk – do these two things now –

1. *Check up on your costs;*
2. *Provide adequate protection for danger points.*

Experienced and competent AMERCOAT engineers are available to help you on both. They'll check up on your costs, which may be greater than you know because the effects of corrosion are often hidden. They'll report on conditions as they find them. They'll recommend steps to take if greater protection can be provided and money saved. Inquiries from interested executives will receive prompt attention. There's no obligation – write today.

AMERCOAT DIVISION
AMERICAN PIPE AND CONSTRUCTION CO.
Dept. 3A, 4809 Firestone Blvd., South Gate, Calif.

Full of vigor . . . and rarin' to go! Put *LCP to work and watch ECONOMY IN ACTION! Pumping . . . Pipelining . . . Refining . . . You name it! Regardless of time, place, or specific job . . . you pay for only the power you use. And it's available WHEN AND WHERE YOU NEED IT! COSTS LESS TO INSTALL . . . LESS TO OPERATE. And with *LCP on the job . . . man-power is free for more directly productive duty. Get more facts from the POWER ENGINEER of your Electric Utility Company TODAY!

*Low Cost Power

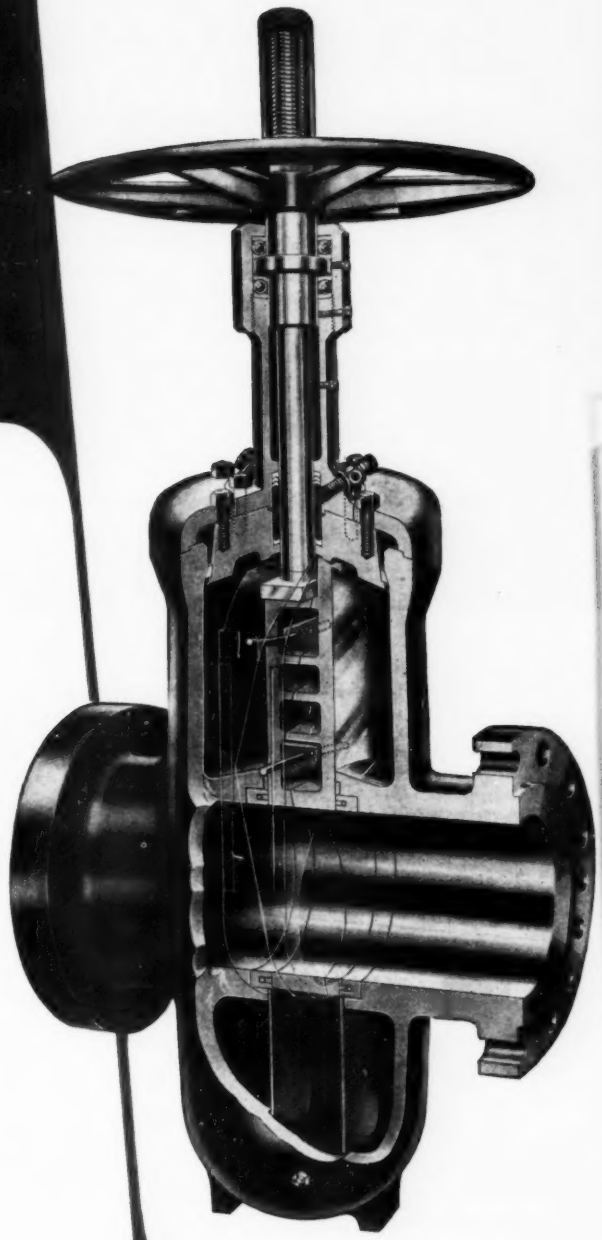
Use Utility Electric Power!

PETROLEUM ELECTRIC POWER ASSOCIATION

Box 1498, Oklahoma City, Oklahoma

No Other Valve Has Ever Received the Immediate World-Wide Approval Given

W-K-M
THROUGH-CONDUIT PIPE LINE VALVES



WHEN W-K-M adapted its dependable-design through-conduit gate valve for pipe line installations, oil, gas and finished product lines, W-K-M Pipe Line Valves immediately set a new standard for the pipe line industry.

W-K-M Valves are the only pipe line valves that seal off completely on both sides every time.

W-K-M Valves are the only pipe line valves with a round, full-opening passage, the same as the I.D. of the pipe, eliminating turbulence and permitting free passage of scrapers.

In both open and closed positions, seats are fully protected from damage of any kind.

W-K-M Valves have positive lubrication . . . freedom from corrosion . . . ease of operation under pressure.

That's why no other valve has ever received the immediate world-wide approval given W-K-M Through-Conduit Gate Valves. We are now delivering W-K-M Through-Conduit Gate Valves in sizes from 2"-30" inclusive.

W-K-M Company, Inc.

OIL FIELD, PIPE LINE & INDUSTRIAL EQUIPMENT

HOUSTON, TEXAS, U. S. A.
LOS ANGELES

Cable Address: "WILKOMAC"
Export Office: 30 Rockefeller Plaza, New York, N. Y.

consider this OUTSTANDING ADVANTAGE of the famous WHELAND SWIVEL

WASH PIPE, special nickel alloy steel, carburized, precision machined, wearing surface heat treated to 700 Brinnell hardness, precision ground, polished and honed for maximum smoothness and minimum packing wear. Wash pipe outside diameters are precision machined in one operation assuring perfect concentricity and perfect alignment. No place to form pockets or restrict mud flow.

Wash pipes can be replaced with minimum time and effort. With just average care, the replacement goes in EASILY and in PERFECT ALIGNMENT.

ALSO IMPORTANT: Spring loaded, lubricated, extra deep, chevron type, wash pipe packing. Lower stem lubricated packing is triple sealed. All packings automatically adjusted, pressure grease lubricated through readily accessible fittings.

All bearings have capacity far in excess of Wheland's capacity ratings. Timken main load bearing with radial and thrust above and below to maintain perfect stem alignment. Upper thrust bearing, tapered cone. All bearings positively sealed off from mud and run in circulated, cooled oil. Large oil capacity.

Long radius gooseneck, streamlined manganese vanadium steel body, lower grease seal, special hold down construction, freedom from adjustments.

4 WHELAND SWIVEL SIZES

Model E-7000—Capacity 464,300 lbs. at 100 R.P.M.
Model E-6600—Capacity 350,000 lbs. at 100 R.P.M.
Model E-6200—Capacity 262,000 lbs. at 100 R.P.M.
Model E-6100—Capacity 130,000 lbs. at 100 R.P.M.

"TEST RUN" BEFORE SHIPMENT

Write Dept. O-1 Bulletin No. 173 sent on request gives details, shows why more and more people are saying:

"WHELAND has the best swivel on the Market."

FIELD SALES REPRESENTATIVES

L. E. FERGUSON
Field Sales Manager
Tulsa • Phone: 3-5406
F. Y. CRONK, JR
Tulsa • Phone: 6-4697
CARL K. MOUNT
Bellaire, Tex.
Phone: Madison 2-9588
VANN M. CAMPBELL
Bellaire, Tex.
Phone: Madison 2-4742
GERALD W. HARMAN
Midland, Tex. • Phone: 3805
Service: W. E. SHORTS
Oklahoma City • Phone: 58-7129

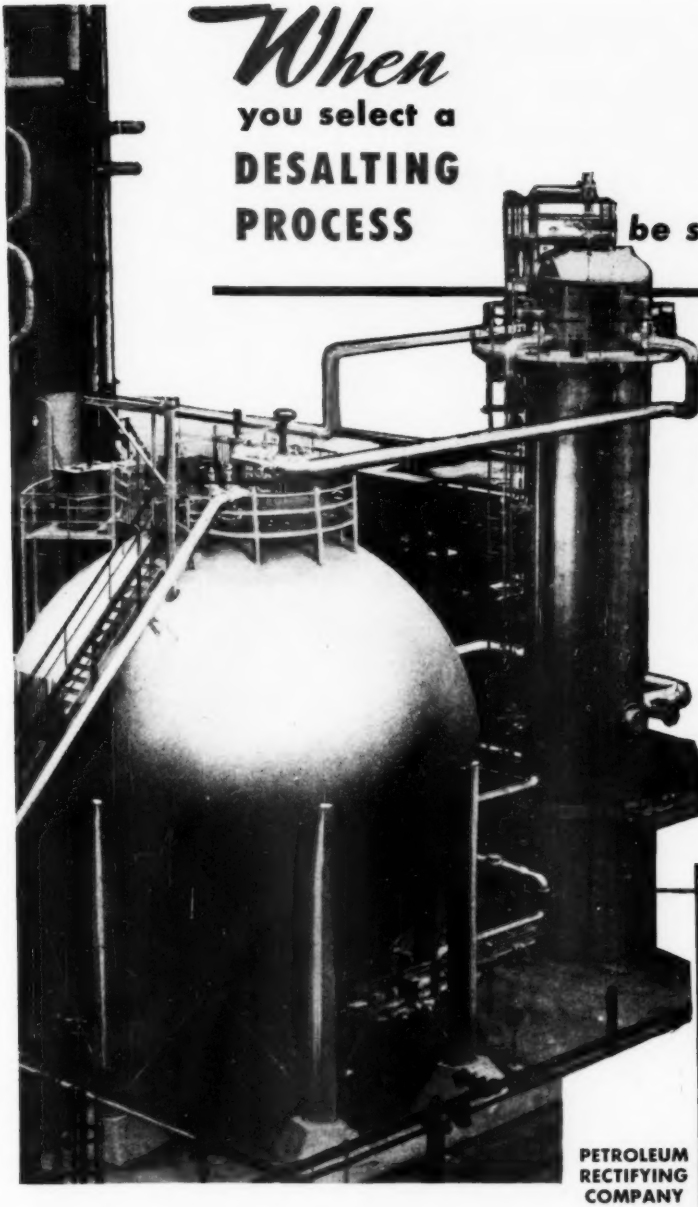
WHELAND

THE WHELAND COMPANY, CHATTANOOGA, TENN., U. S. A.
ROTARY DRILLING MACHINERY

DOMESTIC DISTRIBUTORS
Jones & Laughlin Supply Co.
Tulsa, Oklahoma
Stores and Offices in all Principal Oil Fields and Centers

EXPORT DISTRIBUTORS
Lucey Export Corporation
233 Broadway,
New York 7, N. Y.
Broad Street House
London E.C. 2, England

DRAW WORKS • SLUSH PUMPS • ROTARIES • SWIVELS • CROWN BLOCKS • TRAVELING BLOCKS



When you select a **DESALTING PROCESS** *be sure you get*

SERVICE

Why? Because every experienced refiner knows that any continuous process requires service if it is to continue to operate efficiently. Because of this, more refiners than ever before are specifying PETRECO DESALTING. With Petreco Desalting, *service is included* . . . the *best service know-how* available in the field of desalting today.

PETRECO SERVICE PERSONNEL AND FACILITIES ARE WITHOUT EQUAL IN THE DESALTING FIELD

PETROLEUM RECTIFYING COMPANY

5121 South Wayside Drive, Houston 1, Texas
648 Edison Building, Toledo 4, Ohio
530 West Sixth Street, Los Angeles 14, Calif.

PETRECO

SPECIALIZED *Electric* PETROLEUM PROCESSES { DESALTING / DEHYDRATING

PR-49-1

THE *New* GUIBERSON TYPE J DRILLING HEAD

with FULL-FLOATING WASHPIPE

Increased load-carrying capacity... the ideal tool for drilling-in, reverse circulation and clean-out operations.

Check these improved features!

WASHPIPE PACKING ASSEMBLY IS TAMPER-PROOF

•

NO ADJUSTMENT REQUIRED AT ANY TIME

•

ROTATION IS IN EITHER OR BOTH PACKINGS FOR LONGER PACKING AND WASHPIPE LIFE

•

NO MUD OR DRILLING FLUID CAN ENTER HOUSING

•

REINFORCED HEAD WILL NOW HANDLE TUBING STRINGS UP TO 8,000 FEET IN DEPTH

•

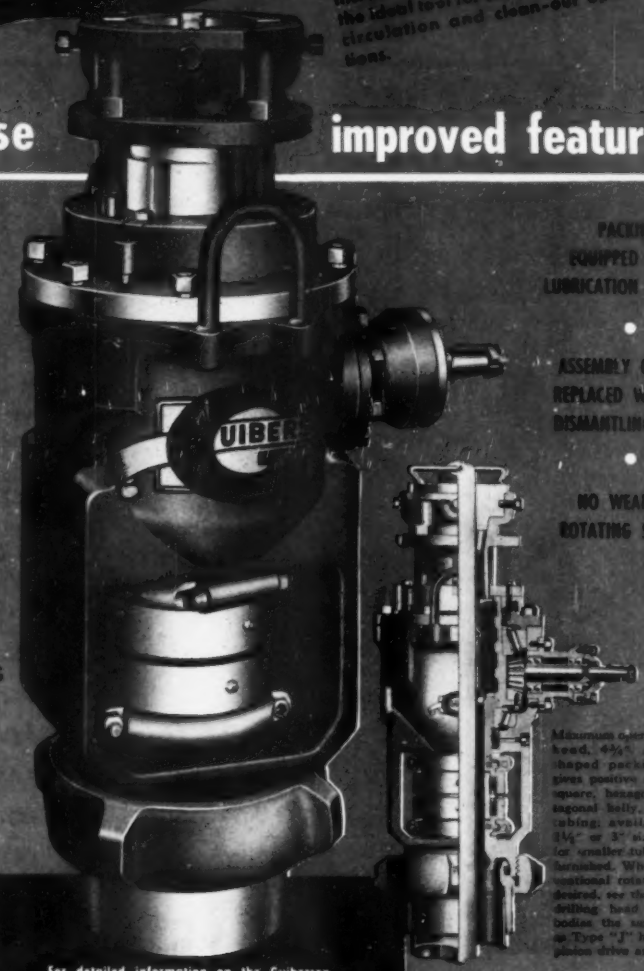
PACKINGS EQUIPPED WITH LUBRICATION FITTINGS

•

ASSEMBLY CAN BE REPLACED WITHOUT DISMANTLING HEAD

•

NO WEAR ON ROTATING SPINDLE



Maximum opening through head, 4¾". Accordion-shaped packing rubber gives positive seal around square, hexagonal, or octagonal kelly, as well as tubing; available to 2", 2½" or 3" sizes; rubbers for smaller tubing can be furnished. Where the conventional rotating head is desired, see the Type "R" drilling head which embodies the same features as Type "J" head without piston drive and gear.

For detailed information on the Guiberson Type J Drilling head, write or call the Guiberson office nearest to you.

Reg. U. S. Pat. Off.

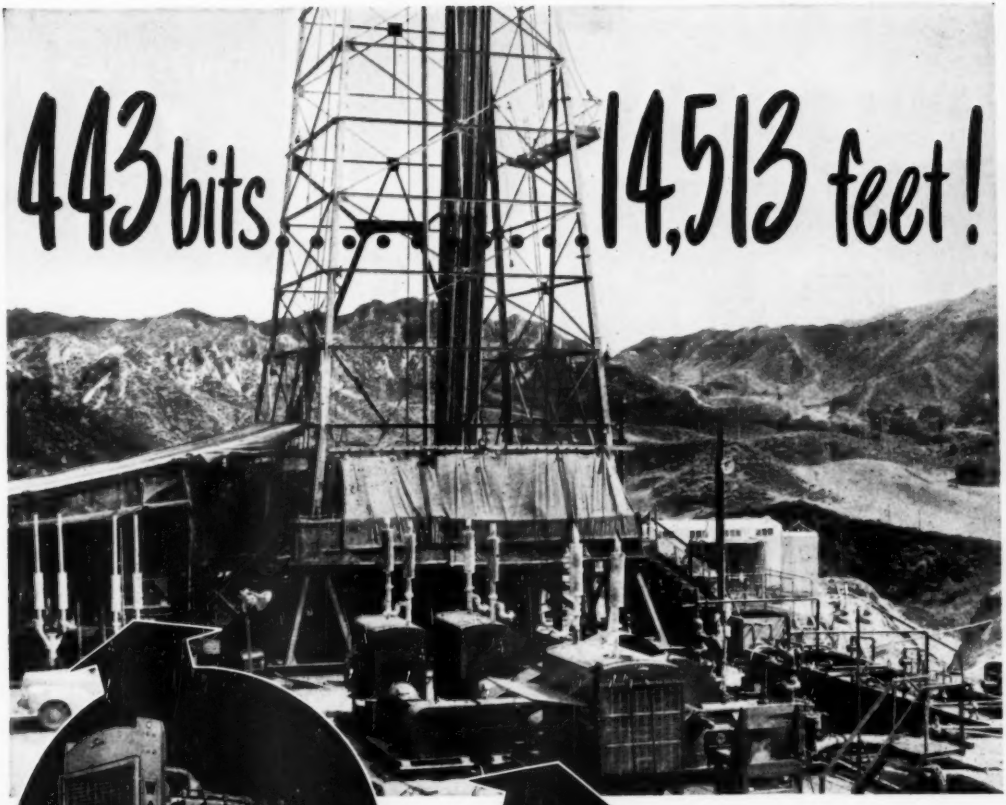
Guiberson U.S.A.

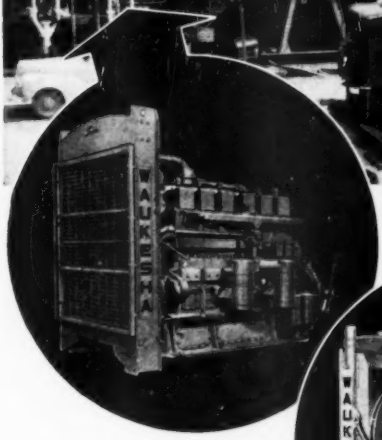
THE GUIBERSON CORPORATION

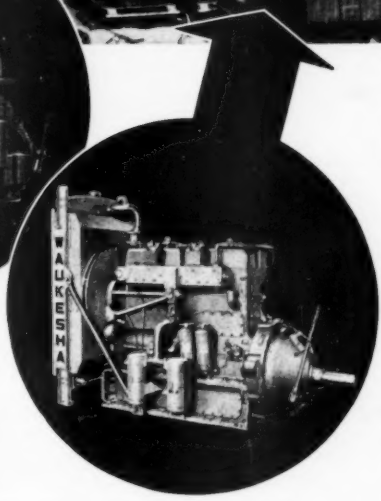
DALLAS, TEXAS — ESTABLISHED 1919

California Distributor: The Wm. E. Guiberson Co., 717 East Gage Avenue, Los Angeles 1. Export Office: 30 Rockefeller Plaza, New York City 20.

443 bits . . . . . 14,513 feet!







(above) Waukesha 6-LROU—six cyl., 8½"x8½", 2894 cu. in.; over 400 peak hp. at 1050 rpm., or 300 hp. continuously at 900 rpm., on natural gas or butane.

●

***(right)* Waukesha 6-NKU**—six cyl., 7"x8½", 1962 cu. in. displ., 225 peak hp. at 1050 rpm., or 173 hp. continuously at 950 rpm., on natural gas or butane.

● **Where the formation is really rugged . . . where they used 443 bits in sixteen months time to make 14513 ft. of hole . . . that's where you'll find *the* rugged engines. You're right—they're Waukeshas.**

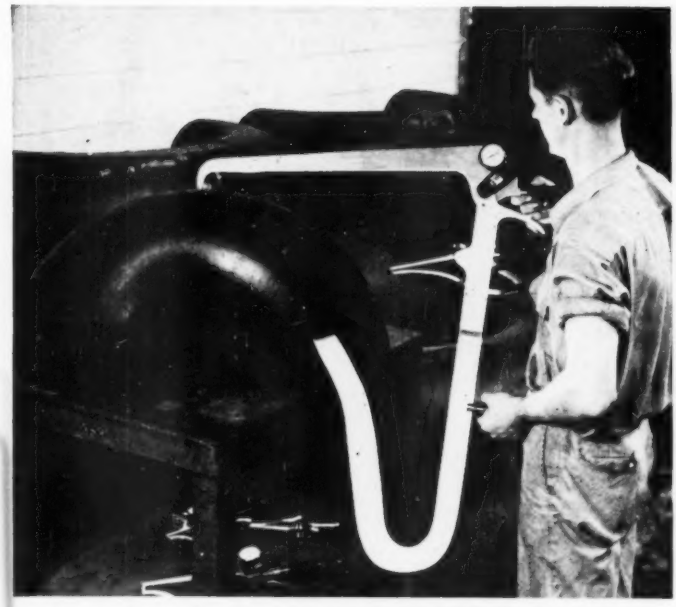
And here you see that same Waukesha-powered equipment drilling another well on the same California location. It's a National drawworks in a 136-ft. Standard Ideco rig. Compounded on the mud pumps, in the foreground, are three Waukesha 6-NKU Gas Power Units. On the drawworks, behind the rolled up tarpaulin, also compounded, are three Waukesha 6-LROU Gas Power Units. Total output—1875 hp. for intermittent service.

Get Bulletin 1506.

WAUKESHA MOTOR COMPANY, WAUKESHA, WIS. • NEW YORK • TULSA • LOS ANGELES

WAUKESHA

Diesel OIL FIELD POWER *Gas*



Precision through Care in Tube-Turn welding fittings

"Mike" checks 'em all!

THE wall thickness of Tube-Turn welding fittings simply has to be right. Every single Tube-Turn welding fitting is micrometer-checked before being put on the market.

Instruments of exclusive design do the trick. They measure wall thickness at the center of an elbow or 180° return as easily, accurately as at any other point. Whether it's ten, a hundred, or a thousand, the Tube-Turn welding fittings you buy are properly matched to pipe of corresponding size—at the face and throughout the fitting. Cut a Tube-Turn welding elbow to any odd angle required. It still lines up.

This micrometer check for dimensional accuracy is a small part of the thorough scrutiny to which the finished Tube-Turn product is subjected.

More than thirty skilled inspectors check for true circularity, accurate center-to-face dimensions, uniformity of curvatures, soundness of outside and inside surfaces, wall thickness of butt ends, bevels, lands, and quality of machining.

And that's just a fraction of the total *care* involved in the manufacture of Tube-Turn welding fittings.

Perfection begins with the raw material which is checked for conformity to required chemical composition and physical properties. It must pass all pre-determined requirements before acceptance for production of Tube-Turn welding fittings. Special materials, of course, undergo special tests.

When you buy "Tube-Turn" you want good connections. That's what you get, every time.

TUBE TURNS, INC.

240 East Broadway, Dept. I, Louisville 1, Kentucky

District Offices at New York, Philadelphia, Pittsburgh, Chicago, Houston, Tulsa, San Francisco, Los Angeles

TUBE-TURN

tt

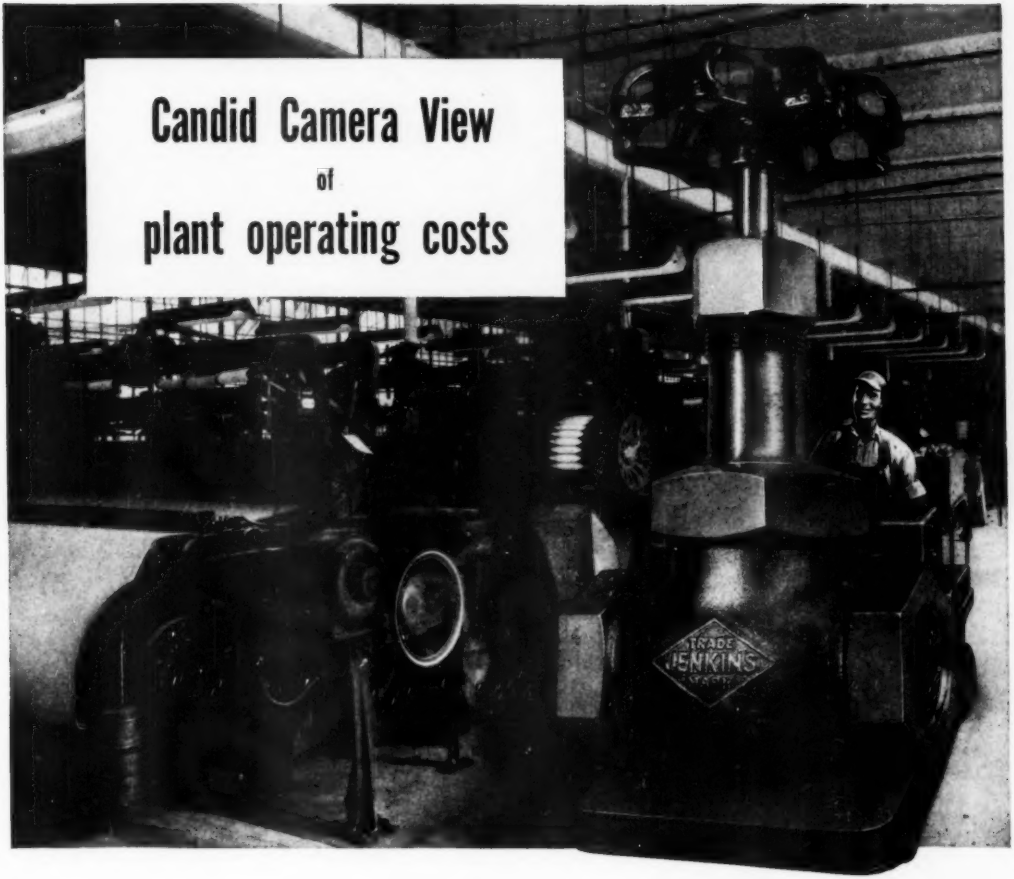
WELDING FITTINGS AND FLANGES

Five different-size gauges of exclusive design are used to check the wall thickness of every Tube-Turn welding fitting.

While one inspector checks the diameter of a 90° elbow, the other checks on perfection of inner wall.

Inspectors check the center-to-face dimension of a 20"-90° Tube-Turn welding elbow.

A part of the final inspection department. Here, Tube-Turn welding fittings undergo intensive instrumental and visual inspection.



FOCUSED on operating costs of a textile plant, a truly candid camera would record this view of valves in proper relation, cost-wise, to other equipment. By the simple photo-magic of showing *all* valves in the plant as *one* valve, the picture points up an important fact—that valves, collectively, are a major investment in *any* plant, *any* large building where operation involves fluid control.

IT PAYS MANAGEMENT to keep this fact in mind. With wages and material costs the highest ever, valve maintenance costs must be watched as carefully as operating expense of larger plant units.

EXCESSIVE MAINTENANCE of one inferior valve is insignificant, but multiplied by thousands, it is a serious drain on operating budgets.

JENKINS BROS. helps you meet this problem two ways. First, by building extra endurance into Jenkins Valves, making them the longest-lasting, lowest-upkeep valves that money can buy. Second, with advice from Jenkins Engineers on any question of proper selection, installation, or maintenance.

For all new installations, for all replacements, rely on Jenkins quality and engineering for lowest valve costs in the long run. Sold through leading Industrial Distributors.

•

Jenkins Bros., 80 White St., New York 13; Bridgeport, Conn.; Atlanta; Boston; Philadelphia; Chicago; San Francisco. Jenkins Bros., Ltd., Montreal.

"PREVENT VALVE FAILURE" is a 28-page guide to valve economy, fully illustrated, with case histories of valve damage, and recommendations for its prevention by proper selection, installation, inspection, and maintenance. FREE on request. Write JENKINS BROS., 80 White St., New York 13, N. Y.

LOOK FOR THIS DIAMOND MARK

SINCE 1864

JENKINS VALVES

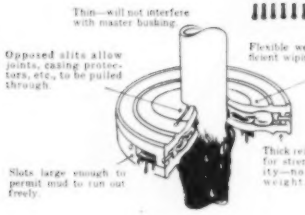
Types, Sizes, Pressures, Metals for Every Need

Clean Pipe

WITH THE

TANDEM Pipe Wiper

Patterson-Ballagh announces the new, field proven TANDEM Pipe Wiper. Easier to install than two single pipe wipers, this efficient TANDEM will wipe your drill pipe *clean* no matter how *fast* you come out of the hole.


Thin—will not interfere with master bushing
Opposed slits allow joints, casing protectors, etc., to be pulled through.
Flexible webs give efficient wiping action.
Slots large enough to permit mud to run out freely.
Thick reinforced section for strength and rigidity—no metal—light weight.

REPLACEABLE HALVES FOR ECONOMY—Identical halves and light hard rubber pins make up the TANDEM. Should either half become worn, only that half need be replaced. Each replacement half supplied with new pins. Halves easily assembled into rigid unit.

TANDEM WIPER FOR EFFICIENCY—Any mud the lower wiper misses, the upper wiper is sure to get. Wipers are spaced far enough apart to prevent mud caking, yet close enough so there is no interference with master bushing.

For top pipe wiper performance, use the new Patterson-Ballagh TANDEM on your rig. For more information, write for Bulletin No. 2-48.

PATTERSON BALLAGH · SEAL OF QUALITY · OUR FINEST SPECIALTIES ·

Specify

PATTERSON-BALLAGH

DIVISION OF BYRON JACKSON CO.

22 Years of Service to the Oil Industry

TANDEM PIPE WIPERS

MAIN OFFICE: 1900 EAST 65th STREET, LOS ANGELES 1, CALIFORNIA

6247 Navigation Blvd., Houston 11, Texas • 808 Graybar Bldg., New York 17, N. Y. • 330 Russ Bldg., San Francisco 4, Calif.

T.I.P.S.A., Santiago Del Estero 286, Buenos Aires, Argentina

SMITHway IS YOUR BEST PUMP BUY

A. O. SMITH is the only Vertical Turbine Pump Manufacturer making all major pump parts in its own plants...

- **DESIGNED TOGETHER**
- **BUILT TOGETHER**
- **TO WORK TOGETHER**

Only A. O. Smith makes all major parts of vertical turbine pumps—your assurance of unsurpassed quality control, precision fitting, years of dependable low-cost service, and one source of undivided responsibility.

Seventy-five years of experience are back of the research and engineering A. O. Smith has built into SMITHway Pumps—in improved impeller design . . . precision pump assembly . . . sturdy, long-lasting construction.

MAXIMUM ADAPTABILITY. SMITHway Pumps are available with SMITHway Vertical Hollow Shaft Electric Motors, flat pulley or V-belt pulley, and right-angle gear drive. You can choose either water or oil lubrication.

STEEL WHERE STEEL BELONGS. Discharge-head assemblies of SMITHway Pumps are heavy *steel plate,* formed and welded into the strongest, most compact design. Driver support is rigid, vibrationless, yet easily accessible. In the heavy, cast-iron, precision-machined bowls, either semi-open or enclosed type bronze impellers are available.

CERTAIN DISTRIBUTOR TERRITORIES for SMITHway Pumps are still available. Write for full details telling you all about the SMITHway Vertical Turbine Pump franchise. Send the coupon below for our colorful descriptive bulletin.

A. O. SMITH Corporation

Atlanta 3 • Chicago 4 • Houston 2 • Los Angeles 14
Dallas 1 • New York 14 • Midland 5, Texas
Philadelphia 3 • Seattle 1 • San Francisco 4
Pittsburgh 19 • Tulsa 3
International Division: Milwaukee 1

A. O. SMITH Corporation, Dept. OG-849
Milwaukee 1, Wisconsin

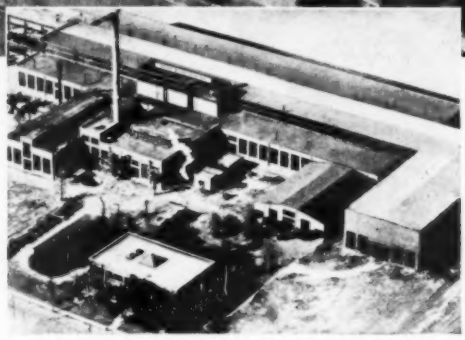
Without obligation, send us your new illustrated descriptive bulletin on A. O. Smith Vertical Turbine Pumps.

Name_____

Street or Route_____ Box_____

City_____ State_____

Shown here are two of the six Combustion manufacturing plants. Chattanooga Plant No. 1 (above) and the St. Louis Plant (right) are devoted chiefly to the production of C-E boilers and pressure vessels.



Equipped WITH EVERY FACILITY

for building boilers and pressure vessels

The fabrication of pressure vessels requires manufacturing facilities and methods identical with those required for building boilers. As one of the world's largest boiler manufacturers, Combustion Engineering—Superheater is, therefore, exceptionally well equipped to build virtually all types of pressure and vacuum vessels.

That the oil industry recognizes Combustion as a reliable source of such equipment is evidenced by the fact that we have produced literally thousands of towers, drums, tanks, stills—in fact, refinery vessels of all types and sizes—for many of the leading companies in the industry. We shall welcome the opportunity to bid on your requirements.

In addition to pressure vessels, Combustion offers you the well-known Vertical-Unit Boiler, likewise widely known and highly regarded in the refinery field. VU Units with an aggregate capacity of nearly 12,000,000 lb of steam per hr are presently installed or on order for the oil industry. The VU-50 Boiler enables the average plant to achieve a standard of economic performance closely approaching that obtained in large central power stations and is available in capacities up to 350,000 lb of steam per hr, pressures to 1000 psi and total steam temperature to 900 F and above. For plants having small operating and maintenance personnel, Combustion offers the VU-10, available for capacities from about 10,000 to 50,000 (or more) lb of steam per hr with pressures up to 480 psi. Investigate the Vertical-Unit Boiler when next you are in the market for steam generating equipment. B-337

COMBUSTION ENGINEERING—SUPERHEATER, INC.

A Merger of Combustion Engineering Company, Inc. and The Superheater Company

200 Madison Avenue • New York 16, N. Y.

PRODUCTS FOR THE REFINING INDUSTRY INCLUDE STEAM GENERATING, FUEL BURNING AND RELATED EQUIPMENT; ALSO PRESSURE AND VACUUM VESSELS

PROOF - *not Guesswork*

Makes FWD America's Foremost Heavy-Duty Truck

Here's actual operating proof in oil field service. This FWD is plowing through loose sand to get equipment to location. Yes — work such as this demands going power only four driving wheels can give you. What's more, you know before you buy, because FWDs are proving-ground tested to climb a 6% grade through blow sand 3 feet deep. *No wonder many of the world's leading oil field operators standardize on FWDs — with individual fleets of over 600 units!*

WHAT FWDs DO ON THE PROVING GROUND
1 Highball over hilly curved roads!
2 Slog thru mud — up to the bumper!
3 Speed over 100-ft. unbanked circle!
4 Twist over ditches —18 inches deep!
5 Drive up 6% grade thru 3-ft. of sand!
6 Climb 70% grade from dead stop!
7 Climb 8-in. beam from standstill!
8 Drill pole holes to prove equipment!
9 Speed safely over level highways!
1
2
3
5
6
7
8
9

This is FWD's proving ground. This is your assurance that the FWD you select has the stamina to insure long life without expensive mechanical breakdowns.

An FWD plows through 3 feet of sand at the proving ground. For all the facts on FWD, see your FWD distributor — or write FWD direct.

An Invitation To Truck Buyers

We invite you to watch FWDs pass a series of rigid performance tests. Ask your FWD distributor to arrange your visit to our plant. Or — if you can't get away, ask him to show you the movie, *The FWD Story*. In either case, you will see for yourself how FWD trucks can help solve your heavy-duty trucking problems.

Martin G. Otter
President
The Four Wheel Drive Auto Company

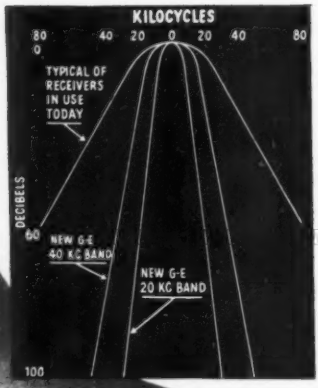
THE FOUR WHEEL DRIVE AUTO COMPANY
Clintonville, Wis. • *Canadian Factory:* Kitchener, Ontario
FOUR AND SIX WHEEL DRIVE TRUCKS

America's Foremost Heavy-Duty Truck

Announcing

A 2-WAY RADIO THAT MEETS OR EXCEEDS ALL NEW FCC RULES!

New 25-50 MC EQUIPMENT FOR 20 KC OR 40 KC CHANNELS



HERE'S WHY IT'S SO GOOD! ● Permits double the number of usable channels in the same spectrum space. With it you can take advantage of a national allocation plan, set up on 20 kc channels, to reduce skip interference ● Extends your communication range. Weak signals come through "loud n' clear" because of the famous G-E wide-crown receiver response curve ● Includes instantaneous modulation control, which automatically compensates for loud or soft, high or low pitched voices. Holds transmission inside assigned channel—thus meeting FCC requirements well in advance of the deadline.

FCC and INDUSTRY ASKED FOR IT—HERE IT IS!

The FCC Order of May 6, 1949 emphasized the need for equipment that would operate on closer spacing than 40 kc. The new G-E equipment shown here meets this need NOW. In chart at left note how closely the G-E curve approaches the ideal flat-top, straight-side response. In recent tests, G-E 20 kc equipment completely eliminated off-chan[illegible] skip interference: skip signals did not even open the recei[illegible]

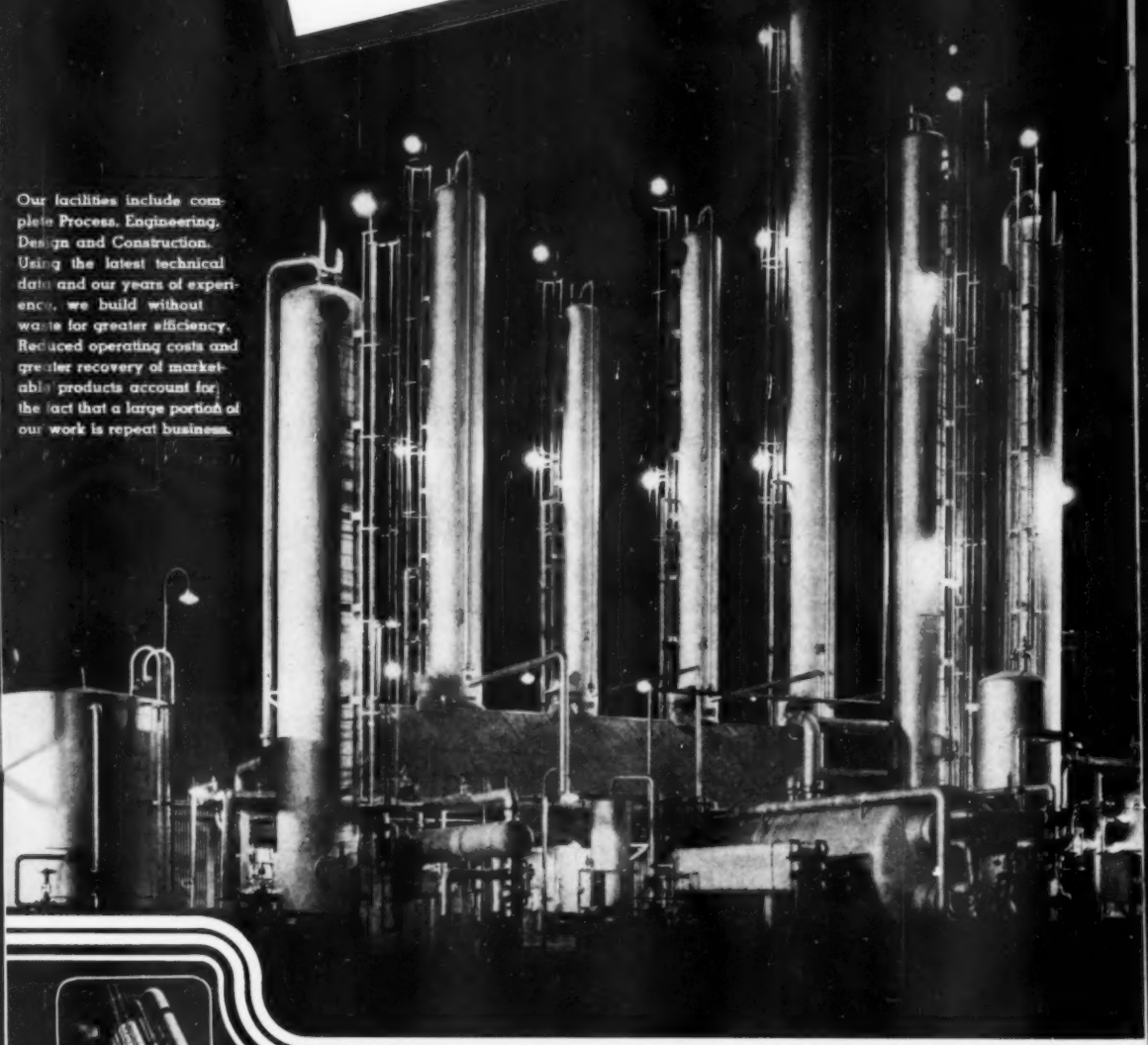
You can put your confidence in—

GENERAL ELECTRIC

TEST IT IN YOUR PRESENT SYSTEM
WITH OUR GENEROUS
Trial Offer!
AFTER two years of intensive engineering and rigorous performance tests, these new G-E units are now in full production and are ready to take on the toughest communication jobs you can give them! They are performance-engineered at Electronics Park* to withstand extremes of heat and cold as well as the severe vibration of mobile service—built to give you the clear, sharp reception you've been waiting for!
Here's an opportunity to test this new G-E equipment—an opportunity you can't afford to miss!
TO PRESENT USERS OF 30-44 MC EQUIPM
OF ANY MAKE!
The most important single item in your entire radio communication system is the base station receiver. Step up the performance of your present 30-44 MC system by installing one of the new G-E receivers in your central station. You'll notice the difference immedi
your entire net. Off-channe
reduced almost to the
signals will come t
ever before. And
If the new G-E unit doesn't do a better job for you than
General Electric will take it back
*World center of electronics progress—General Electric's new "U
versity of Industry" at
New York.
Do the Talking!
Clip and Mail this Coupon Today!
(For even faster action, call the radio communication representative at the G-E office nearest you, or wire General Electric Company, Building 1, Room 239, Electronics Park, Syracuse, New York.
General Electric Company—Bldg. 1—Room 239K
Electronics Park, Syracuse, New York
I am interested in your Trial Offer. Send me all the facts on the new G-E 25-50 mc equipment and have your representative call on me.
NAME.....
TITLE or COMPANY.....
ADDRESS.....
CITY.....STATE.....
REMARKS.....

Greater EFFICIENCY
Less INVESTMENT

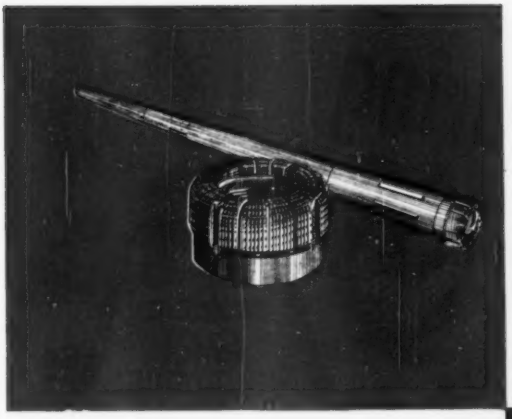
Our facilities include complete Process, Engineering, Design and Construction. Using the latest technical data and our years of experience, we build without waste for greater efficiency. Reduced operating costs and greater recovery of marketable products account for the fact that a large portion of our work is repeat business.



Engineering and Construction Division

JONES & LAUGHLIN SUPPLY COMPANY

TULSA, OKLAHOMA



Core Lab's *SPIRAL-SET* Diamond Bits and Core Barrels

complete a solid spread of reservoir engineering services

.....from discovery to maximum recovery.

DIAMOND CORING EQUIPMENT
DRILL CUTTINGS ANALYSIS
CORE ANALYSIS
RESERVOIR FLUID ANALYSIS
PRODUCTION RESEARCH
ENGINEERING STUDIES

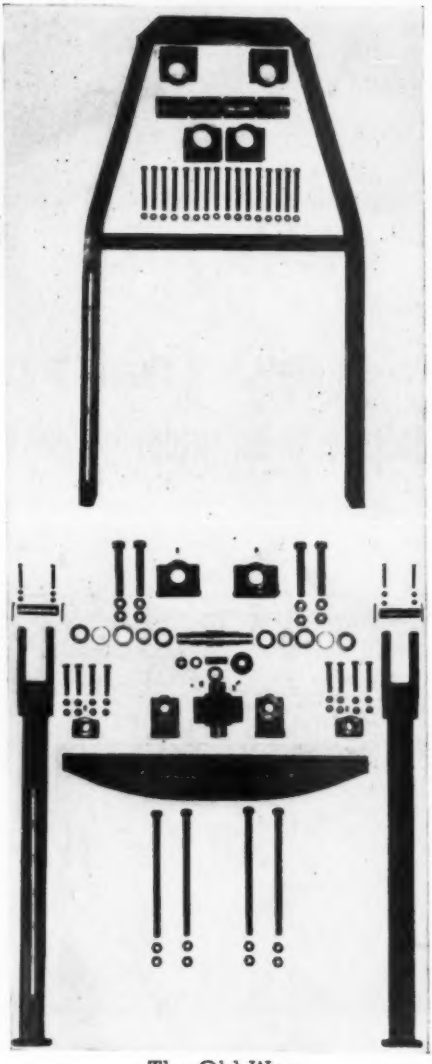
CORE LABORATORIES, INC. ● DALLAS, TEXAS

DALLAS HOUSTON CORPUS CHRISTI SHREVEPORT TYLER LAFAYETTE NATCHEZ
OKLAHOMA CITY DENVER MIDLAND ABILENE RANGELY WORLAND BAKERSFIELD

"From discovery to maximum recovery."

New CABOT Equalastic Bearing

The New Way



The Old Way

This new Bearing Assembly combines Evener Beam and Pitmans in one piece plus the Equalastic Bearing, four clamps and 16 sets of bolts and nuts . . . total parts: 38. The conventional bearing assembly contains 100 parts, many finely machined, produced to close tolerances and all subject to wear, rust and maintenance. The Cabot Equalastic Bearing consists of a single alloy steel shaft with four heavy rubber bushings vulcanized to it. On the outside of each rubber bushing, two steel half shells are vulcanized, with space between halves to allow for compression clamping. It's simple . . . it's time-saving . . . it requires no lubrication or maintenance!

Now available on all Cabot pumping units!

Distributed Exclusively by Jones & Laughlin Supply Company, Tulsa, Oklahoma

CABOT SHOPS, INC. PAMPA, TEXAS.

a complete petroleum refinery

capacity: 110,000 bbls/day

Foster Wheeler will build this complete refinery—the largest in Europe—for Anglo-American Oil Co. Ltd., affiliate of Standard Oil Company (New Jersey).

In collaboration with the Engineering Division of the Standard Oil Development Company, Foster Wheeler will provide mechanical design and engineering and will construct 9 process units including a large Fluid Catalytic Cracking Unit.

With the exception of tankage, marine facilities and administration and laboratory buildings, Foster Wheeler will also erect all off-site facilities, including a complete steam plant.

This is an outstanding example of the comprehensive engineering and construction service offered by Foster Wheeler. It is available—anywhere in the world—for all types of petroleum processing units, complete petroleum refineries, and complete chemical plants.

FOSTER WHEELER CORPORATION
165 BROADWAY, NEW YORK, 6 NEW YORK

Foster Wheeler welcomes this opportunity to congratulate The American Petroleum Industry on its 90th Birthday.

(Colonel Edwin Drake brought in the nation's first commercial oil well on August 27th, 1859,—90 years ago this month)

FOSTER WHEELER CORPORATION

165 BROADWAY, NEW YORK 6, NEW YORK

A Complete Engineering and Construction Service—Anywhere in the World

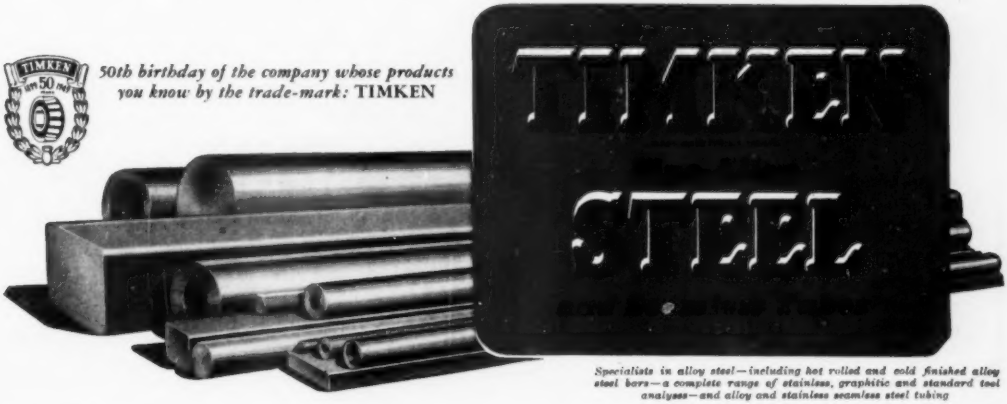
If you're redesigning to cut costs, do it around this hole

BY making your hollow cylindrical parts out of Timken® seamless tubing instead of bar stock you save material costs and simplify manufacturing. With Timken tubing, drilling is eliminated because the hole is already there. There's less stock to machine, less scrap. Finish boring is often your first production step. Parts cost less to make.

You get a better quality product, too. The piercing process by which Timken tubing is made is basically a forging operation. This gives the tubing a *uniform spiral grain flow* for greater strength, and a *refined grain structure* which brings out the best in the quality of the metal. And this fine forged quality is uniform from tube to tube and from heat to heat, thanks to Timken's rigid quality control.

To make the most of Timken tubing, use our Tube Engineering Service. We take full responsibility for giving you the most economical tube size for your job —guaranteed to clean up. You're sure of minimum machining time—maximum saving of metal. And you run no risk of not having enough wall thickness to fill out your finish dimensions. To have our Tube Engineering Service make an obligation-free analysis of your requirements, write The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

50th birthday of the company whose products you know by the trade-mark: TIMKEN



Specialists in alloy steel—including hot rolled and cold finished alloy steel bars—a complete range of stainless, graphitic and standard tool analyses—and alloy and stainless seamless steel tubing

Get your equipment to location

on time--every time

regardless of weather and running conditions!

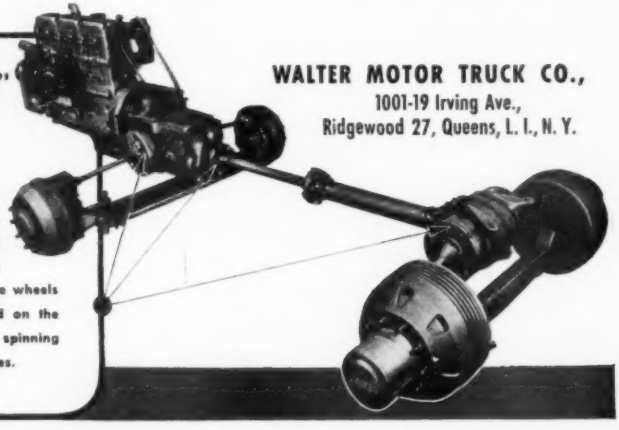
OILFIELD hauling is mostly off-the-highway hauling, which calls for special design in the trucks you use. Power and ruggedness are important—but they are helpless without unfailing TRACTION to keep loads moving in all kinds of terrain and weather.

Walter Tractor Trucks combine all three—power, traction and ruggedness—to a degree found in no other truck. Especially designed and built for severe off-highway hauling, Walter Tractor Trucks keep your heavy rigs, pipe and servicing equipment moving on schedule, regardless of hauling conditions.

The outstanding feature of Walter Tractor Trucks is the 4-Point Positive Drive which provides super-traction, as described below. They also incorporate many other exclusive engineering features especially developed for gruelling off-highway hauling. Write today for detailed literature giving the complete story.

How WALTER "Mechanical Brain" concentrates wheelpower where needed, when needed

• In the Walter 4-Point Positive Drive System, three automatic locking differentials act like a "mechanical brain", proportioning power to each wheel according to its traction at any instant. If one, two, even three wheels lose traction, power is automatically concentrated on the working mates. No power is wasted on helpless, spinning wheels; no bogging down on soft or slippery surfaces.



WALTER MOTOR TRUCK CO.,
1001-19 Irving Ave.,
Ridgewood 27, Queens, L. I., N. Y.

OUTSTANDING ADVANTAGES OF RAYMOND CONCRETE PILES

Raymond's successful experience for more than a half century has thoroughly proved these six outstanding advantages of Raymond Concrete Piles. These benefits, plus Raymond's expert personnel and specialized equipment, result in sound, dependable substructures that meet every requirement. You are invited to consult our engineers for the facts.

1 PERMANENCY

2 GREATER CARRYING CAPACITY

3 UNIFORM BEARING CAPACITY

4 ENGINEERED FOR THE JOB

5 SAVING IN CONSTRUCTION COST

6 COMPLETE SATISFACTION

RAYMOND CONCRETE PILE CO.

AMERICAN OFFICES AND AFFILIATED CLUBS OF RAYMOND GROUP AND OTHER AMERICAN

140 CEDAR STREET · NEW YORK 6, N. Y.

AROUND THE WORLD
52 YEARS FOUNDED 1897 OF PROGRESS

THE SCOPE OF RAYMOND'S ACTIVITIES

Includes every recognized type of pile foundation—concrete, composite, precast, steel, pipe and wood. Also caissons, underpinning, construction involving shore protection, shipbuilding facilities, harbor and river improvements and borings for soil investigation.

O-C-T C-19

...the only Casing Hanger that meets every well completion condition in a single compact model

When the "C-19" Casing Head was introduced to the industry more than two years ago, engineering tests had proved that this major advancement in well control equipment was good for long, heavy strings on 20,000' wells.

Now, on The Superior Oil Company's Pacific Creek No. 1, Sublette County, Wyoming, the O-C-T "C-19" . . . a standard head shipped right out of stock . . . has distinguished itself in service at 19,765' on the world's longest, heaviest string of casing, consisting of a combination of 32, 29, 26, 29 and 32 lb. 7" casing.

Suspended weight on this Superior record well was approximately 475,000 pounds by weight indicator reading.

Designed for quick setting and positive sealing, O-C-T "C-19" Casing Heads feature a unitized suspension and seal which greatly simplifies installation, saves rig time, and improves the safety of the completion operation because the well is closed in around the casing before blowout preventers are unflanged.

In addition, O-C-T "C-19" Casing Heads step up crew safety because the hanger is shipped assembled in a single unit, ready to install from the derrick floor, reducing hazardous work in the cellar.

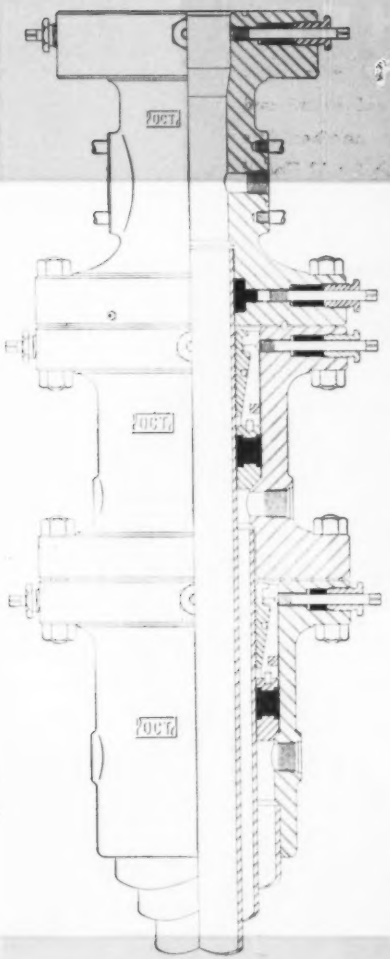
On your next deep well . . . on wells of any depth . . . take advantage of the added strength, safety, convenience and flexibility the O-C-T "C-19" provides. It's the only slip type head that meets every well completion condition with a single compact model.

Write Today

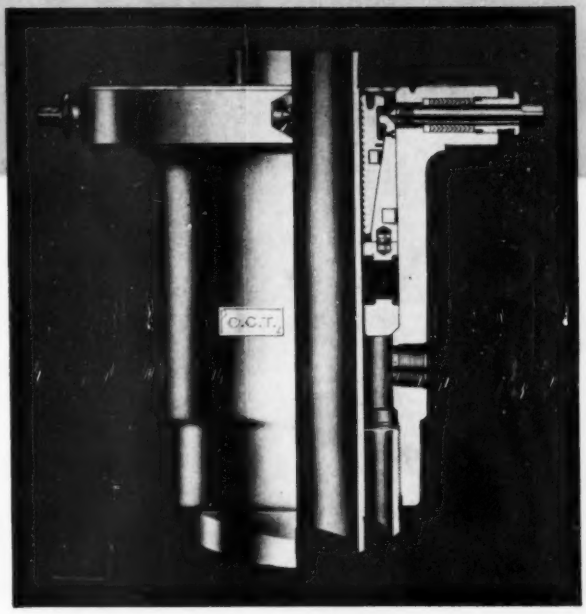
Send for your free copy now of this new O-C-T "C-19" booklet entitled "20,000' and then some." This 24-page book contains complete engineering specifications and details on the "C-19" with recommended wellhead assemblies for deep, high pressure wells.

NOW PROVED DEPENDABLE

AT 20,000' *and then some!*



With the O-C-T "C-19" Casing Head as the foundation, this O-C-T wellhead assembly is installed on The Superior Oil Company's world's deepest well. It supports 9,981' of 47 and 53½ lb. 9⅝" casing and 19,765' of 7" casing.



This model O-C-T "C-19" Casing Head was used on The Superior Oil Company's new world's record depth well. It is available in two models . . . C-19 with lock screws or C-19-C without lock screws.

ASSOCIATION OF WELL HEAD EQUIPMENT MANUFACTURERS CERTIFIED

Oil Center Tool Co.

great names

LESCHEN

Uncle Sandy

THE UNITED SUPPLY MAN

Courtesy
Service
Dependability

UNITED SUPPLY
AND *Manufacturing* COMPANY
TULSA, OKLAHOMA
Stores in Kansas, Oklahoma, Texas,
Louisiana, and New Mexico

Keeping the Navy "*Ship Shape*" with the Dempster-Dumpster . .

Shipyards, stations, and the men in Uncle Sam's Navy set a standard of cleanliness that is unsurpassed. Helping to maintain this high standard of Navy cleanliness is the Dempster-Dumpster System of materials handling . . . a system of quick pick-up of preloaded containers for hauling, dumping or moving materials.

Exactly 10 years ago the Navy purchased its first Dempster-Dumpster equipment . . . one truck hoisting unit with several containers. Now there are dozens of hoisting units and thousands of Dempster-Dumpster containers of many types at work keeping Navy yards and stations "ship shape." The sturdy steel foolproof and fireproof containers are placed at various places, such as barracks, mess halls, the docks and ship yards, wherever materials (solids or liquids) need be deposited immediately as they accumulate. A Dempster-Dumpster truck hoisting unit quickly picks-up each container when it is filled and hauls it to the disposal area. Contents are automatically dumped and container returned.

If you have a materials handling problem demanding more cleanliness, more economy, and more efficiency, it will pay you to investigate the Dempster-Dumpster System—popularly used, not only by the armed forces, but by municipalities, leading industrial plants, and by large and small institutions of all kinds.

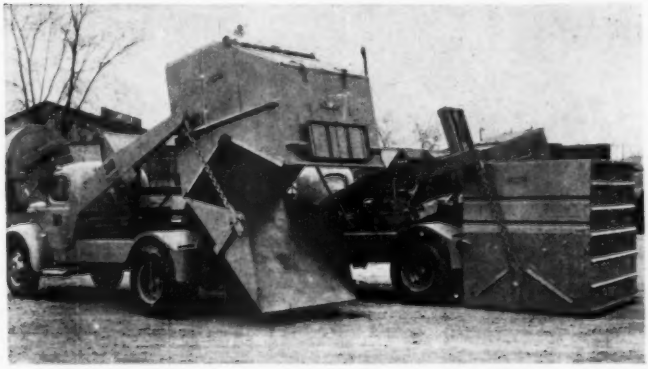


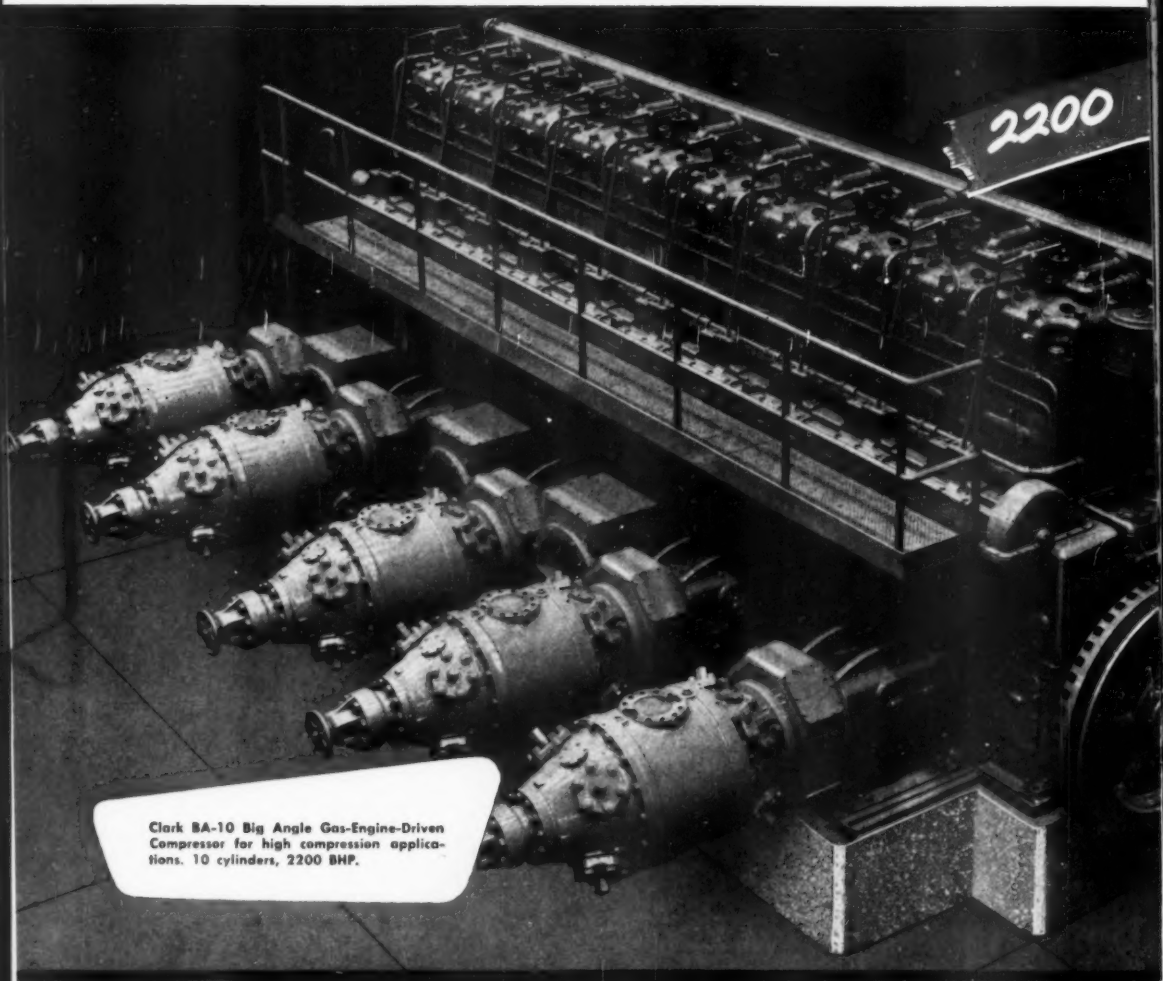
Photo above shows eleven hoisting units recently delivered to the U. S. Navy. Various types of containers are shown in carrying positions. Photo at left shows a hoisting unit preparing to lift a 10 cu. yd. Flat Top container, while another hoisting unit is dumping a 9 cu. yd. Trash and Rubbish Kolector type container. All controls of unit are conveniently located at the driver's seat. One driver and one truck handles any number of containers regardless of types.

DEMPSTER BROTHERS INC.

589 Dempster Bldg.
KNOXVILLE 17, TENNESSEE

When your pipeline operations call for

BIG COMPRESSORS



Clark BA-10 Big Angle Gas-Engine-Driven Compressor for high compression applications. 10 cylinders, 2200 BHP.

CLARK SETS THE PACE

ONE OF THE DRESSER INDUSTRIES

...CALL IN CLARK!

BHP GAS ENGINE DRIVEN

5500 BHP CENTRIFUGAL

the ONLY Company that builds BOTH!

For large volume and high compression applications . . . call in the *one* company that builds *both* large Gas-Engine-Driven Compressors and Centrifugals.

Since we build both, we "have no axe to grind" in recommending the type best suited for your application. Each has its particular advantages . . . in first cost, operating cost, performance characteristics and installation requirements.

A Clark Bros. engineer will give you an unbiased analysis and recommendation on your large compressor needs . . . or any size compressor from 5 BHP up. Write or phone your nearest Clark Bros. office.

CLARK BROS. CO., INC. • OLEAN, N. Y.

New York • Tulsa • Houston • Chicago • Boston
Washington • Los Angeles • London • Buenos Aires • Caracas, Venezuela.

Clark single stage, pedestal type, centrifugal pipeline compressor of which there are several installed on the Big and Little Inch pipelines.

IN COMPRESSOR PROGRESS

THE CASE OF THE Abandoned Orphan

Is the clutch in your equipment an abandoned orphan . . . deprived of its inheritance . . . with no home to turn to?

Then it's time to shift to Twin Disc . . . the clutch you'll never find abandoned like the one in the illustration. For every Twin Disc Clutch is backed by the same parental interest and responsibility that have distinguished the products built by Twin Disc for the past 31 years.

Ample parts stocks and trained mechanics in the 5 Branch Offices and 47 Twin Disc Parts Stations assure prompt service. Exceptional demands can be met by over-night shipments from the factory or from one of the five factory branches, where perpetual inventories are maintained . . . eliminating the need for costly made-to-order parts for original installations or subsequent parts replacements.

These are the reasons why manufacturers continue to standardize on Twin Disc Clutches year after year, and why they are preferred by owners and operators of all types of power-driven equipment.

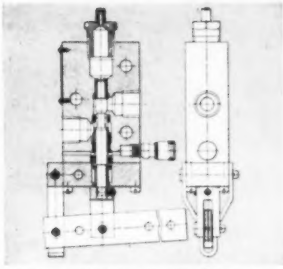
TWIN DISC CLUTCH COMPANY, Racine, Wisconsin (Hydraulic Division, Rockford, Illinois).

SPECIALISTS IN INDUSTRIAL CLUTCHES SINCE 1918

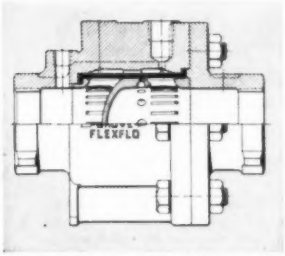
UNFAILING PERFORMANCE —EVEN ON SEVERE EROSIVE SERVICES

GROVE model 899 Separator Oil Valve

- NO SEEP—NO LEAK
- POSITIVE DEAD-TIGHT SEAL
- RESISTS SAND CUTTING
- PRESSURES UP TO 1000 P.S.I.
- TEMPERATURES UP TO 150° F.



Section of Full Stroke Operator.



Sectional view of Flexflo Valve.

The Grove Model 899 is a combination of the proved Flexflo Valve with a control valve designed especially for direct float-operated separator service. The positive action and dead-tight seal of the Flexflo, together with the lever-operated "Full Stroke" control Valve, gives an ideal non-throttling oil discharge control for any oil-gas separator at pressures up to 1000 p.s.i.

The Full Stroke Control Valve is a 3-way Seat-Seal valve, designed so that one port must close completely before the other opens. No throttling pressure can be applied to the Flexflo jacket . . . the Flexflo will always be either fully open or tightly closed.

On rugged services, handling the most gritty and abrasive fluids, Grove Separator Oil Valves outlast all others and cut maintenance costs to the bone. Wire, write or call your nearest Grove representative today—ask for full information on the Model 899.

GROVE REGULATOR COMPANY
65th & Hollis Street Oakland 8, Calif.
Factory Branches: 3608 Navigation Blvd., Houston, Texas; 1930 W. Olympic Blvd., Los Angeles 6, Calif.

GROVE

GROVE
SIMPLICITY
ACCURACY
SAFETY
"PUTS PRESSURE TO WORK"

MODEL 899
Separator
OIL VALVE

All the facts of value favor

CHEVROLET ADVANCE-DESIGN TRUCKS

America's truck operators are wise buyers. They know the value of prime power with economy . . . of massive load capacity . . . of outstanding quality, durability and handling ease. They know the advantages of the latest and finest features and of greater driver comfort and convenience. And they know that *all* the facts of value favor Chevrolet trucks to an overwhelming degree . . . that they cost less to operate, less to maintain, and have the lowest list prices in the entire truck field. That's why they use Chevrolet trucks more than any other make!

CHEVROLET MOTOR DIVISION, *General Motors Corporation*, DETROIT 2, MICHIGAN

TOP-VOLUME PRODUCTION BRINGS YOU TOP-VALUE FEATURES!

Chevrolet's new 4-SPEED SYNCHRO-MESH TRANSMISSION offers quicker, quieter and easier operation. Double clutching is eliminated because the gears are always in mesh. Faster shifting maintains speed and momentum on grades. Available in series 3800 and heavier duty models.

Chevrolet's power-packed VALVE-IN-HEAD ENGINES provide improved durability and efficiency as well as the world's greatest economy for their size!

Chevrolet trucks have the famous CAB THAT "BREATHES"*! Outside air is drawn in and used air forced out! Heated in cold weather.

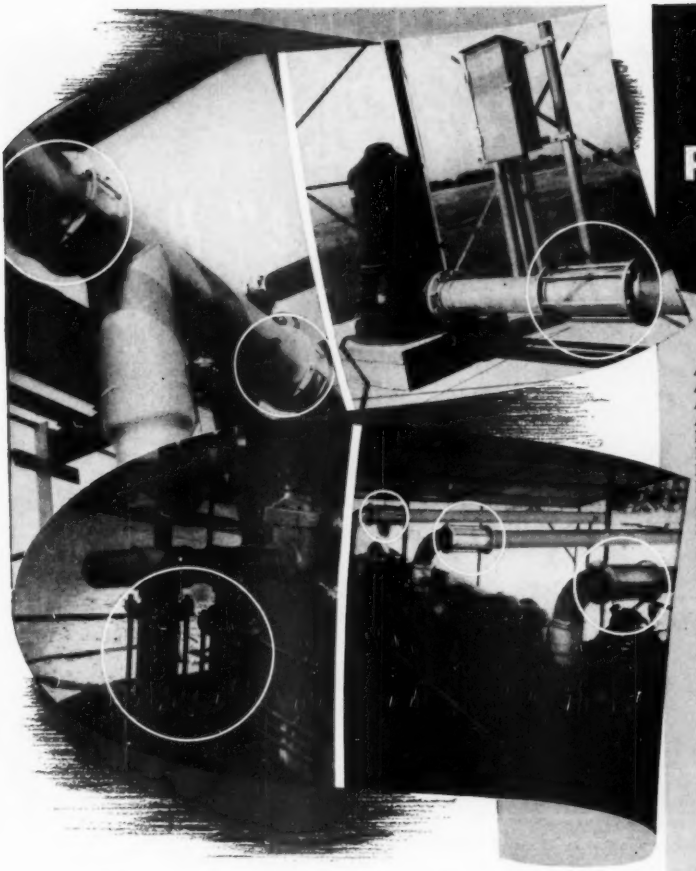
Chevrolet Advance-Design brings you the FLEXI-MOUNTED CAB, cushioned on rubber against road shocks, torsion and vibration.

Chevrolet's exclusive SPLINED REAR AXLE HUB CONNECTION adds greater strength and durability to heavy-duty models.

Unisteel, All-Steel Cab Construction • Large, Durable, Fully-Adjustable Seat • All-Round Visibility with Rear-Corner Windows* • Heavier Springs • Super-Strength Frames • Full-Floating Hypoid Rear Axles in the 3600 Series and Heavier Duty Models • Double-Articulated Brake Shoe Linkage • Hydrovac Power Brakes in Series 5000 and 6000 Models • Multiple Color Options.

**Heating and ventilating system and rear-corner windows with de luxe equipment optional at extra cost.*

CHOOSE CHEVROLET TRUCKS FOR TRANSPORTATION UNLIMITED! CHEVROLET



You can buy DRESSER PRODUCTS through these companies

(Partial List)

Alamo Iron Works
American Pipe & Supply Co.
American Supply Co.
Arrow Supply Co., Inc.
Banks-Miller Supply Co.
Bethlehem Supply Co.
F. W. Black
Bluefield Supply Co.
Bovaird & Co.
Bovaird & Seyfang Mfg. Co.
The Bovaird Supply Co.
Bradford Supply Co.
Briggs-Weaver Machinery Co.
Brown-Strauss Corp.
The Cameron & Barkley Co.
Capitol City Supply Co.
Cen-Tex Supply Co.
Clowe & Cowan, Inc.
Continental Supply Co.
Crane Co.
Dunigan Tool & Supply Co., Inc.
Federal Oil Field Supply Co.
Federal Supply & Machine Co., Inc.
Franklin Supply Co.
French Tool & Supply Co.
Frick & Lindsay Company
General Oil Field Supply Co., Inc.
Greenhead Supply Co.
Grinnell Co., Inc.
Houston Oil Field Material Co., Inc.
Howard Supply Co.
Industrial Supply Co.
International Derrick & Equipment Co.
Iverson Supply Co.
Jarecki Manufacturing Co.
Jones & Laughlin Supply Co.
Lloyd-Smith Co.
Louisiana Supply Co.
The McJunkin Supply Co., Inc.
Mid-Continent Supply Co.
Midland Supply Co., Inc.
Morrison Supply Co.
Mountain Iron & Supply Co.
Murray-Brooks Hardware Co., Ltd.
Murray Tool & Supply Co.
The National Supply Co.
Norvell-Wilder Supply Co.
Oil Well Supply Co.
Parkersburg Rig & Reel Co.
The Peerless Supply Co., Inc.
Pelican Well Tool & Supply Co.
Producers Supply & Tool Co.
Republic Supply Co.
Republic Supply Co. of California
Rodman Supply Co.
San Antonio Machine & Supply Co.
Standard Supply & Hardware Co., Inc.
Superior Iron Works & Supply Co., Inc.
United Supply & Mfg. Co.
Weaks Supply Co., Ltd.
Well Machinery & Supply Co., Inc.
Western Supply Co.
Wilson Supply Co.
Zanesville Tool & Supply Co.

There's nothing handier

THAN A DRESSER

Available through your favorite supply store, Dresser Couplings and Long Sleeves are handy to use in a thousand places. They make quick, dependable connections on gathering lines, water lines, mud lines, Christmas trees, tank connections, equipment hookups, valve settings. Save time, save money, save headaches—use Dressers.

DRESSER COUPLINGS and Repair Products

Dresser Manufacturing Division (One of the Dresser Industries), 59 Fisher Ave., Bradford, Pa. • Houston Office & Warehouse: 1121 Rothwell Street, Houston, Texas. • Sales Offices: New York, Chicago, Houston, San Francisco.

FOR IMMEDIATE SHIPMENT — CALL METAL GOODS

Now you can put corrosion-resistant Monel* Heat Exchanger Tubing to work for you — without delay! A stock of ¾" OD x 0.065" (16 BWG) and 0.083" (14 BWG) wall x 16' long Monel* Tubing is on hand for fast delivery from our Houston warehouse.

Where high corrosion resistance plus strength and toughness are needed . . . count on Monel* for *all* these advantages:

VISIT THE 4th NATIONAL INSTRUMENT EXHIBIT
MUNICIPAL AUDITORIUM
ST. LOUIS, MO.
SEPT 12—16, 1949
See our display in BOOTH 131

- **Readily fabricated, and expanded into Tube Sheets.**
- **High resistance to hydrogen sulfide, hydrochloric acid, sulfuric acid and brine. Withstands hydrofluoric acid in HF alkylation.**
- **Resists effects of cavitation and impingement.**
- **Stands up in caustic soda reboilers and in condensers for chlorinated solvents and furfural.**

For shipment TODAY . . . phone, wire or write your nearest Metal Goods warehouse.

*Reg U S Pat Off

METAL GOODS CORPORATION

OFFICES AND WAREHOUSES: St. Louis, 5250 Brown Ave. • Houston, 711 Milby St. • Tulsa, 302 N. Boston
New Orleans, 432 Julia St. • Dallas, 6211 Cedar Springs Rd. • Denver, 817 17th St • Kansas City, 1300 Burlington

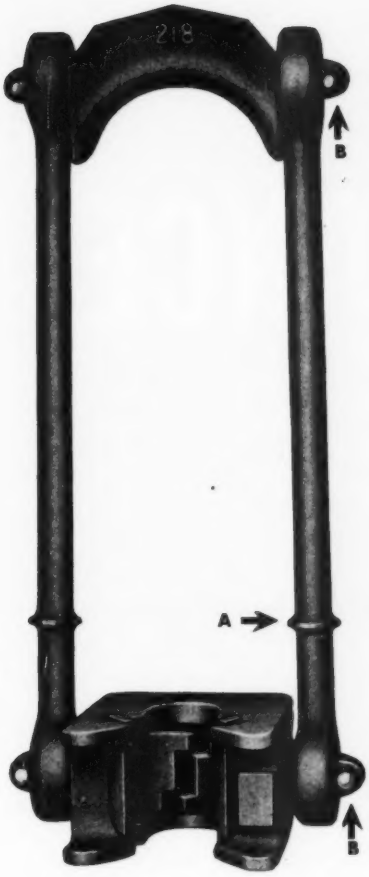


Figure 1: Open position showing details of the locking device.

Faster, Easier, Safer Operating

RATIGAN NO. 218 TUBING ELEVATOR

The new, improved Ratigan No. 218 Tubing Elevator was designed to fill an urgent demand for a faster, easier, safer operating elevator for pulling tubing, especially where gin poles and portable rigs are used. It is a single bail elevator and can be used on either side. It operates just as fast and smooth as a rod elevator.

The locking device is fast, positive and absolutely safe. It is opened instantly (figure 1) from the front by pushing the plunger ("C" figure 3); or from the back by pulling the curved handle (figure 3).

A safety ring ("A" figure 1) on the reins has been added to help keep the operator from gripping the reins too close to the body of the elevator and thus help reduce to a minimum, serious hand injuries. Another feature is the separate arch top of the bail. This feature makes it possible to change quickly to different size elevators, and also to different length reins. This can easily be done by the use of Ratigan's quick-change safety locking pins ("B" figure 1).

This new elevator has been tested to 200,000 pounds on an Olsen pulling machine without showing any signs of weakness. It also has been thoroughly tried out in the field under all operating conditions, and has proved very popular with the men who use it, who say it is much faster, easier and safer to operate than the old type elevator.

It can be furnished to take either 2", 2½" or 3" tubing. When ordering, be sure to specify the size desired.

Developed and Manufactured By

J. P. RATIGAN, INC.

1213 Santa Fe Avenue, Los Angeles 21, California

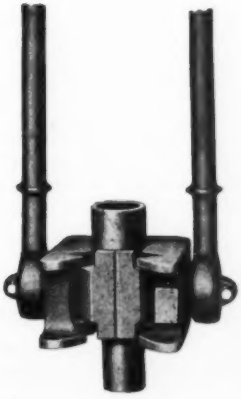


Figure 2: Closed position with tubing firmly in place.

WEIGHT, 143 POUNDS
CAPACITY, 100 TONS

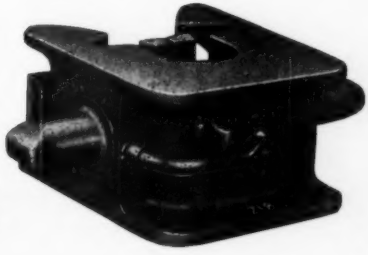
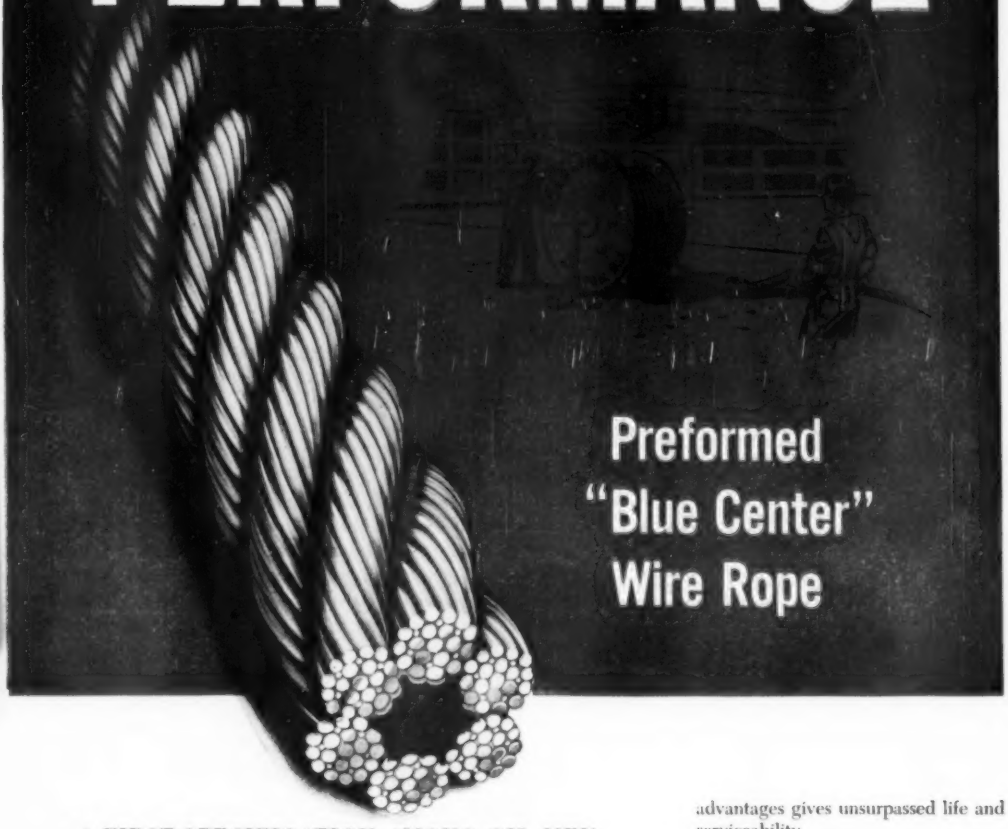


Figure 3: Back of body showing handle for operating locking device from back.

JOIN THE TREND TO TOP

PERFORMANCE



A FIRST SPECIFICATION AMONG OIL MEN

WHEN YOU PULL DOWN COSTS these days it's something to brag about. And with Preformed "Blue Center" Wire Rope you can cut costs to the minimum.

"Blue Center" Steel—made only by Roebling—provides shock resisting stamina and toughness. The Preforming process—improved and perfected—simplifies installation, reduces whipping and vibration, improves winding. It is not inclined to twist and kink . . . is easy to handle and install . . . can be cut without seizing. This combination of advantages gives unsurpassed life and serviceability.

Roebling Wire Rope is one of the best-known products in industry today. There's a type and size for every kind of service. Have your Roebling Field Man suggest the *one* rope best adapted to your requirements. John A. Roebling's Sons Company, Trenton 2, New Jersey.

Distributed by: The National Supply Company
Republic Supply Company

ROEBLING
☆ A CENTURY OF CONFIDENCE ☆

A New and Very Important GASO PUMP

Fig. 3364 2¼" x 3" Gaso Horizontal Triplex Plunger Pump

Features!

Capacity up to 44 barrels per hour at 900 pounds working pressure. Gaso economy and dependability.

•

Available as complete, self-contained pumping unit, with any type of power desired.

•

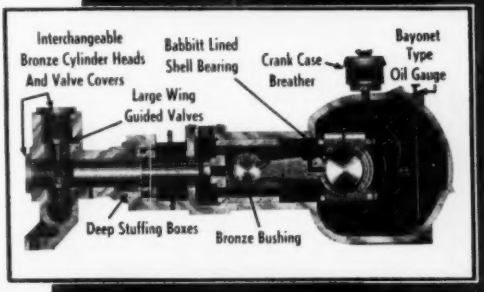
Power input is direct to extra heavy alloy steel crank shaft journaled in tapered roller bearings. There are no internal gears.

Adaptable to Many Uses . . . Rugged . . . High-Pressure . . . Economical . . . Available as Complete Unit

Fig. 3364 is Gaso's answer to the need for a light-weight, high-pressure pump of many uses. Delivering up to 44 barrels per hour at 900 pounds pressure, it is ideally suited for service on small oil leases in connection with crude oil gathering systems, salt water disposal or fresh water supply. It is equipped with a molybdenum alloy cast iron fluid end for oil service or with an aluminum-bronze fluid end for corrosive fluids.

Fig. 3364 is available as a complete and self-contained pumping unit, with any type of engine or motor that the customer may specify.

Ask for special bulletin on this new Gaso Horizontal Triplex Plunger Pump.

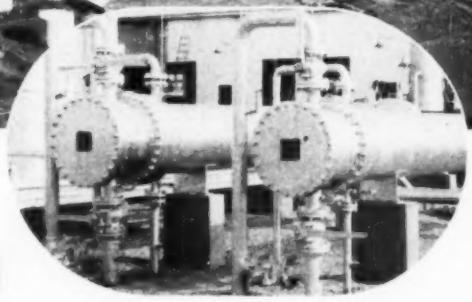


GASO PUMP & BURNER MFG. CO.
902 EAST FIRST ST., TULSA, OKLA.
Export Office. 149 Broadway, New York
Shreveport and Odessa: W. L. SOMNER CO.
Los Angeles: PRODUCTION EQUIPMENT CO., Inc., 651 E. Gage Ave.

GASO PUMPS
for every oil industry need

WESTERN ENGINEERED PRODUCTS for *High Octane* PRODUCTION

SUNRAY OILS



At . . . . .

SUNRAY OIL CORPORATION

Western shell-and-tube exchangers, like those shown at right, must perform steadily and efficiently to meet the high standards of high octane gasoline production at Sunray's Duncan plant, pictured above.

DUNCAN, OKLA., REFINERY

Many of the nation's finest refineries, gasoline plants, chemical processing plants and pipelines depend on Western heat exchanger's economical, uninterrupted service. The flexibility of Western's engineering and manufacturing skill deserves your consideration. Write for complete information.

WESTERN
HEAT EXCHANGERS

Manufactured by

WESTERN SUPPLY COMPANY

P.O. BOX 1888 TULSA, OKLAHOMA

SALES OFFICES — DALLAS — HOUSTON

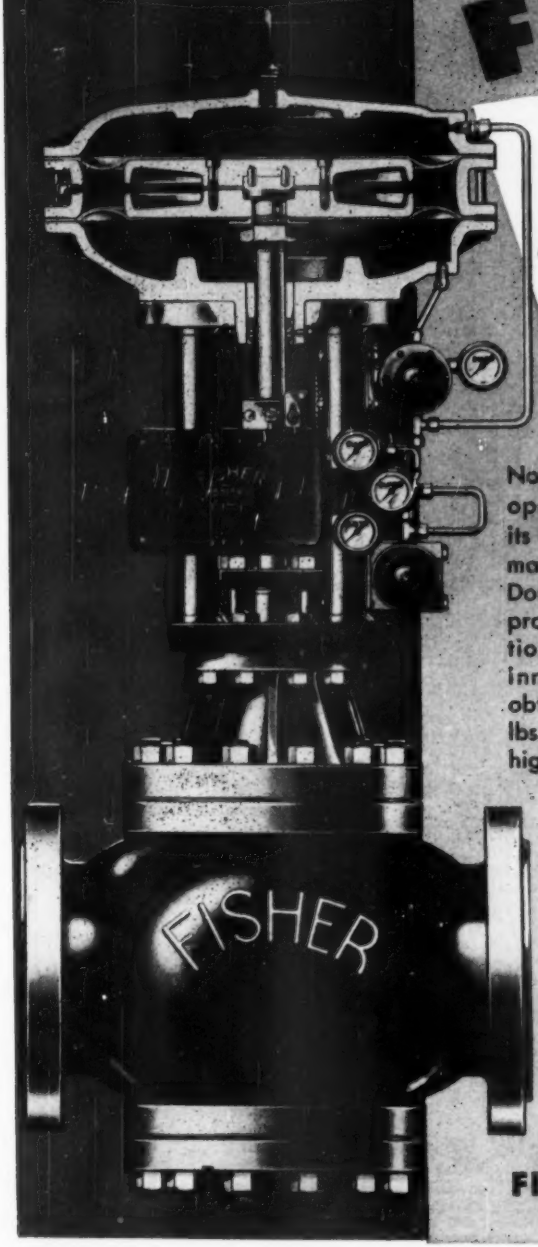
See Western's catalog pages in the current issues of Chemical Engineering Catalog, Refinery Catalog, and Thomas Register.

A GIANT AMONG GIANTS

FISHER

*AMT

DIAPHRAGM MOTOR VALVES



Now, stem thrust power up to 5000 lbs. for opening or closing at any point within its travel range. Full pneumatic performance. No springs, no levers or weights. Double diaphragm avoids backlash effects probable with single diaphragm construction. Fisher Positrol accurately positions inner valve. In action, performance obtained with operating pressure up to 30 lbs. Designed for fast stroke action and high stability.

Why? Gives extreme power to actuate large single-seated valves for tight shut-off on large pressure drops up to 5000 pounds unbalanced forces.

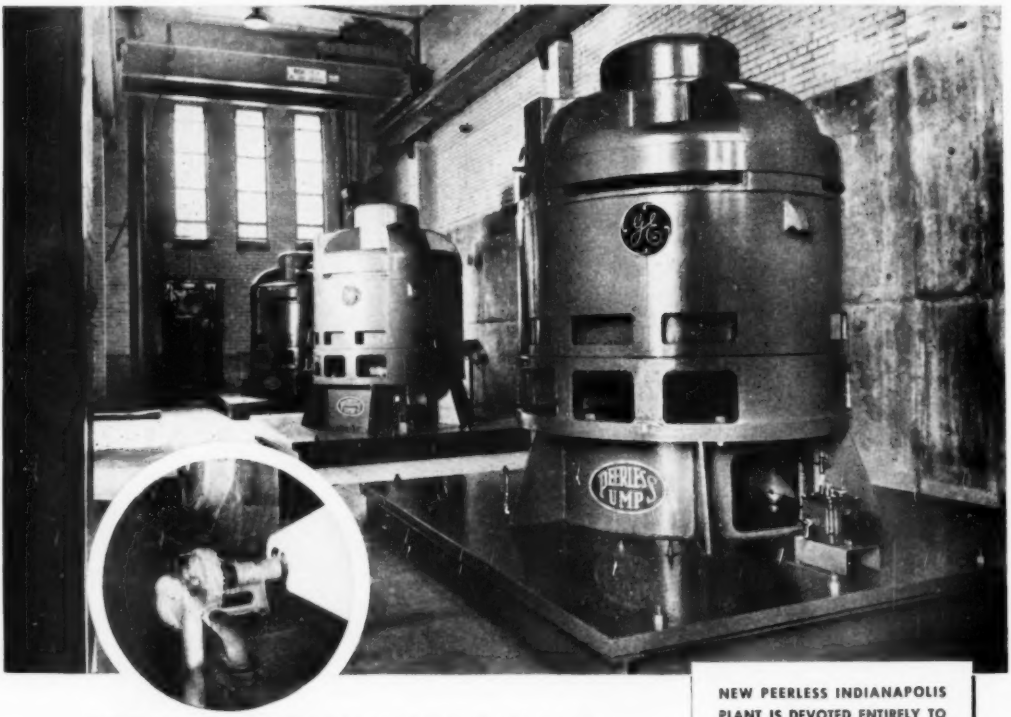
*AMT

"ANSWER ME TWICE" IN ACTION. PRESSURE **ADDED** TO ONE DIAPHRAGM, **SUBTRACTED** FROM OTHER.

Write today for Bulletin 5700

FISHER GOVERNOR CO.
MARSHALLTOWN, IOWA

WIDEST CAPACITY RANGE



FROM A COMPREHENSIVE LINE OF VERTICAL AND HORIZONTAL PUMPS

Peerless offers 2 to 220,000 gallons per minute

A tapful or a torrent! No matter what your water capacity requirements are, Peerless can meet your pumping needs.

Fractional hp horizontals, like the Peerless "Fluidyne" pumps handling cooling-jacket water in the inset above, furnish a few gallons a minute. The huge Peerless mixed-flow pumps in the larger photo, pump away drainage water at the rate of tens of thousands of gallons a minute.

Widest capacity range is but one of a host of reasons why industries, municipalities and commercial businesses plan with Peerless for all their needs for pumps. Here are others:

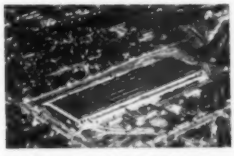
ALL PRACTICAL HEADS: Lifting water from 1000 feet or more is a practical accomplishment of Peerless vertical deep well pumps. Pumping against heads of 690 feet is a common task for Peerless horizontal centrifugal pumps.

ALL TYPES OF DRIVE: Electric motor, right angle gear, engine, belt (V or flat) or combinations of the above, are all available from Peerless, with pump and driver engineered as a unit.

MODERN DESIGN: Peerless pumps are designed for top flight performance over extended periods of time. And the practical consideration of ease of maintenance and repair is figured in to their functional, good looking design.

NATIONWIDE SERVICE: Peerless sales and field service is available in all principal U. S. cities and abroad. Plan with Peerless for all your pumping needs. Individual bulletins on all types of Peerless Pumps are available upon request.

NEW PEERLESS INDIANAPOLIS PLANT IS DEVOTED ENTIRELY TO PUMP PRODUCTION AND SERVICE



Here is one of America's newest pump plants—19 acres of modern manufacturing facilities devoted to precision production of horizontal and vertical pumps, centrally located at Indianapolis. Plan with Peerless for pumps plus fast, complete pump service.

Peerless
VERTICAL AND HORIZONTAL
Pumps

fmc
PEERLESS PUMPS

PEERLESS PUMP DIVISION
FOOD MACHINERY AND CHEMICAL CORPORATION
Los Angeles 31, California — Indianapolis, Indiana

District Offices: New York 5, 37 Wall Street; Chicago 40, 4554 N. Broadway; Atlanta Office: Rutland Bldg., Decatur, Ga.; Omaha, Nebr., 4330 Leavenworth Street; Dallas 1, Texas, 3905 Elm Street; Fresno, Calif.; Los Angeles 31, Calif.

Trade secret...

A skilled craftsman is only as good as the tools and materials he works with...

The handicraft arts and brilliant colorings achieved by the Navajo Indians have never been duplicated... never been surpassed... for this is skill at its finest.

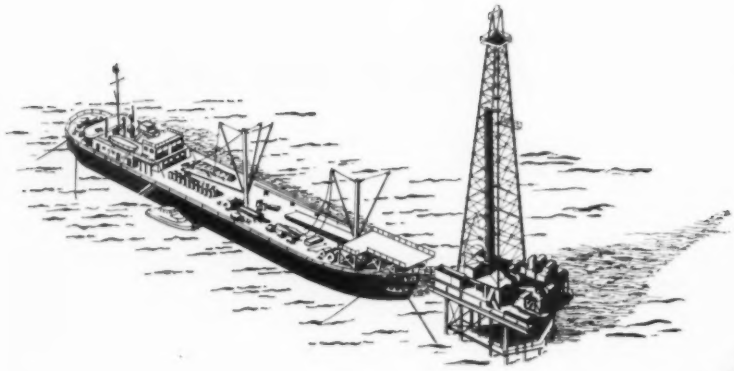
Wheatland pipe, too, is the result of unsurpassed workmanship. The proof? The thousands of skilled plumbers throughout the nation who ask for "the pipe with the yearmark"!

Pre-testing, careful inspection, constant attention to every detail of construction and operation—help give you stronger, cleaner pipe—pipe that will endure. And this is our goal.

-pipe with the yearmark!

WHEATLAND TUBE COMPANY

BANKERS SECURITIES BUILDING • JUNIPER AND WALNUT STREETS • PHILADELPHIA 7, PA.



Levingston

PIONEER IN THE DEVELOPMENT OF MARINE DRILLING EQUIPMENT –

Specializing in Submersible Drill Barges and Offshore Drilling Tenders

Levingston

SHIPBUILDING COMPANY

ORANGE, TEXAS

NEW HELPFUL GUIDE

to gas regulating problems

This new Airco Regulator catalog gives authentic, understandable information on the function and operating characteristics of regulators for the following types of service –

- for welding, cutting, heating, hardening and inert shielded arc welding.
- on cylinders, manifolds and pipe lines.
- for all types of compressed gases – oxygen, acetylene, nitrogen, hydrogen, helium, argon and other industrial gases.
- for use in the laboratory.
- dual stage regulation . . . single stage regulation – and a quick "reason why" one or the other type would give you desired uniform pressures, at less cost, for a particular job.

Everyone concerned with regulating gases under pressure will find use for this helpful catalog. It will save him time, effort and needless waste of money. It contains data regarding the proper regulator for any given type of job.

Send for this valuable, informative guide today! Fill in the coupon below.

Air Reduction
60 East 42nd Street
New York 17, N. Y.

Please send me a copy of your NEW helpful guide to gas regulating problems – Catalog No. 5.

Name_____

Firm_____

Address_____

City_____ State_____

AIRCO **AIR REDUCTION**
Offices in Principal Cities

Headquarters for Oxygen, Acetylene and Other Gases . . . Calcium Carbide . . . Gas Cutting Machines Gas Welding and Cutting Apparatus, and Supplies . . . Arc Welders, Electrodes and Accessories

WHAT'S TO BE SAID ON THE QUESTION OF DURABILITY

That's Where Quality Scores A Hit!

Durability in a well water system is something that doesn't just happen.

It has to be built-in from carefully made plans, extra good materials and a lot of know how.

With nearly seventy years of experience in designing, building, testing, installing, servicing—and repairing well water systems, it seems quite logical that Layne might know something about what it takes to create durability.

Layne does! And thats a very emphatic statement backed up by actual operating

Layne Vertical Turbine Pumps in sizes from 40 to 16,000 gallons per minute are world famed for rugged construction, long life and economy of operation. Write for pump and pump data catalog.

facts on hundred of systems, many of which according to their tremendous production records should have been worn out years ago, but are still humming along at remarkably high efficiency.

Absolute perfection in any kind of mechanical equipment has never been achieved, but Layne can assure every buyer that their systems are definitely unmatched in long life durability,—a fact that probably accounts for their extraordinarily wide use.

For further information, catalogs, bulletins etc. address

LAYNE & BOWLER, INC.
General Offices
MEMPHIS 8, TENN.

LAYNE

WELL WATER SYSTEMS

AFFILIATED COMPANIES—Layne-Arkansas Co., Stuttgart, Ark. ★ Layne-Atlantic Co., Norfolk, Va. ★ Layne-Central Co., Memphis, Tenn. ★ Layne-Northern Co., Mishawaka Ind. ★ Layne-Louisiana Co., Lake Charles, La. ★ Louisiana Well Co., Monroe, La. ★ Layne-New York Co., New York City ★ Layne-Northwest Co., Milwaukee, Wis. ★ Layne-Ohio Co., Columbus, Ohio ★ Layne-Pacific, Inc., Seattle, Wash. ★ Layne-Texas Co., Houston, Tex. ★ Layne-Western Co., Kansas City, Mo. ★ Layne Minnesota Co., Minneapolis, Minn. ★ International Water Corp., Pittsburgh, Pa. ★ International Water Supply Ltd., London, Ont. ★ Layne-Hispano Americana, S.A., Mexico, D.F

If you're all "gummed up"

in a tough heat transfer problem

Specify..

Vogt Spiral, Spring Type Scraper
Patent No. 2,117,175

Vogt

SCRAPER TYPE CHILLERS

Photos show shop assembly without driving motor.

Fouling of the inner pipe surfaces of Vogt Chillers is eliminated, because they are swept clean continuously during operation by patented spiral, spring type scrapers. And these clean surfaces achieve the highest possible rate of heat transfer between the solution and the refrigerant.

VOGT DOUBLE PIPE TYPE CHILLERS are designed to use ammonia, brine, or cold dewaxed oil as the cooling medium. Oil or brine, when employed, is circulated through the jacket pipes countercurrent to the flow of the solution in the inner pipes.

MULTI-PIPE TYPE CHILLERS, for direct expansion, have large jacket shells each containing seven inner pipe sections and employ volatile refrigerants such as ammonia, freon, propane, etc.

Our engineering staff is qualified by training and experience to help you find the right answers to your heat transfer problems. Their recommendations are available without obligation.

HENRY VOGT MACHINE CO.
INCORPORATED
LOUISVILLE 10, KENTUCKY
BRANCH OFFICES: NEW YORK, PHILADELPHIA, CLEVELAND, CHICAGO, ST. LOUIS, DALLAS

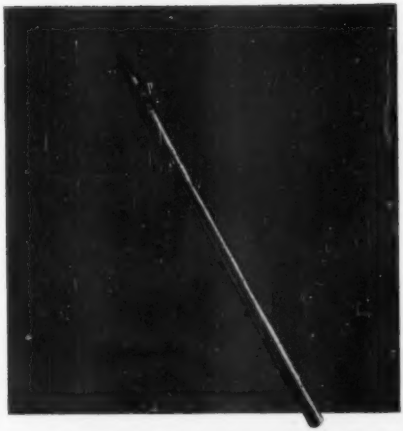
For abrasive ladings a.c.f. Lubricated Plug Valves with clear full circular ports* are ideal. Compact size is retained only through cylindrical plug design...straight-through flow with same shape and cross section as the pipe. Quick quarter turn to open or close...no exposed seats. For every reason a.c.f. Valves should be your first choice.

*Also offered with full area rectangular ports.

a.c.f. CYLINDRICAL FULL PIPE AREA LUBRICATED **PLUG VALVES**

Representatives in more than 50 principal cities.

Ask for catalog 4-OG. American Car and Foundry Company, Valve Division, 30 Church Street, New York 8, New York.



Four years ago Otis perfected the Otis Tubing Caliper – the first completely accurate method of surveying tubing for corrosion under pressure.

Since then, Otis has been considered the industry's leading authority on tubing corrosion survey and analysis. An Otis Caliper crew, with years of experience in pressure control work, can survey as many as 30,000 feet of tubing in a single day *without killing the well or pulling the tubing for inspection.*

Otis crews are now using a new and improved tool with twice the tubing contact as previous models, and an enlarged chart with the same efficient, easy-to-read

OTIS TUBING CALIPER

corrosion survey & analysis

scale which allows the Caliper to log more than 5,000 feet of tubing at a single run. After the entire string has been calipered the metal charts are photostated, each tubing joint is numbered for exact reference, analyzed, tabulated, interpreted by Otis experts, and delivered in a single, comprehensive "*Report on Tubing Corrosion Survey.*" With this easy-to-read, letter-size folder, an operator can check at a glance the true internal condition of the entire string, or each joint or coupling individually.

For a survey of your wells – made by the industry's experts on tubing corrosion analysis – call the Otis office nearest you. Or if you'd like more information, ask Otis to show you some sample survey reports. There's no obligation, of course.

Many operators set up regular schedules of service in order to maintain a constant check on corrosion conditions of wells recently completed or operating in high-pressure areas where corrosion is likely. Write Otis at Box 7206, Dallas, Texas, for more information on periodic tubing surveys.

PRESSURE CONTROL – OTIS – SERVICE – EQUIPMENT

TUBING CALIPER

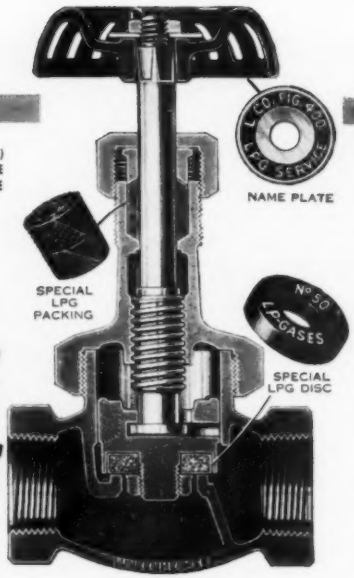
(T-30)

DISTRIBUTORS. **OTIS PESSSURE CONTROL, INC.**, DALLAS, TEX. **OTIS EASTERN SERVICE, INC.**, BOLIVAR, N.Y. **WESTERN PRESSURE CONTROL**, LOS ANGELES, CALIF. FIELD OFFICES. **TEXAS:** HOUSTON, CORPUS CHRISTI, FALFURRIAS, VICTORIA, ODESSA, and LONGVIEW. **OKLA.:** OKLAHOMA CITY. **LA.:** NEW IBERIA and HOUMA. **MISS.:** BROOKHAVEN. EXPORT SALES AND SERVICES. **OTIS PRESSURE CONTROL EXPORT, INC.**, POST OFFICE BOX 7206, DALLAS, TEXAS, U. S. A.; CARACAS, SOUTH AMERICA. MANUFACTURE AND DEVELOPMENT. **OTIS ENGINEERING CORPORATION**, POST OFFICE BOX 7206, DALLAS, TEXAS, U. S. A.

400 lb. W.O.G. (Water-Oil-Gas)
Fig. 400, GLOBE
Fig. 401, ANGLE

SPECIFY THESE LUNKENHEIMER VALVES

FOR DEPENDABLE LP GAS SERVICE



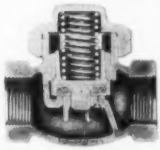


Fig. 403
LIFT CHECK WITH SPRING

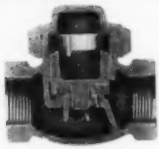


Fig. 402
LIFT CHECK

FOR Liquefied Petroleum Gases . . . in LP-Gas systems, bulk transfer and storage tanks, domestic cylinder charging manifolds, vapor differential compressors and the many industrial uses . . . Lunkenheimer 400 lb. LPG Valves meet every need. Designed for this service and reflecting Lunkenheimer Quality throughout, these rugged valves have special packing, and in globe, angle and check valves a special, easily renewable non-metallic disc. They seat tight and stay tight. These valves are approved by Underwriters' Laboratories, Inc., for LP-Gas.

LUNKENHEIMER DISTRIBUTORS are located in all oil producing and refining centers. Write for Bulletin 576, or ask your distributor for a demonstration of Fig. 400 "N-M-D" Valves for Liquefied Petroleum Gases.

ESTABLISHED 1862
THE LUNKENHEIMER CO.
"QUALITY"
CINCINNATI 14, OHIO, U. S. A.
NEW YORK 13 CHICAGO 6
BOSTON 10 PHILADELPHIA 34
EXPORT DEPT. 318-322 HUDSON ST., NEW YORK 13, N. Y.

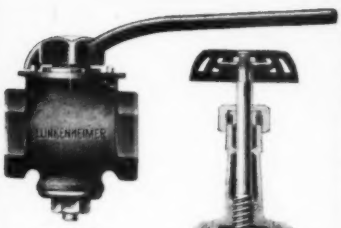


Fig. 904
Bronze Gas Throttle Cocks
Can be used in industrial plants on Butane and Propane burners, engines, etc. The diamond shaped port in the body provides extremely accurate regulation, from very fine to full flow.

Fig. 404
Bronze Union Bonnet Gate Valve
400 lb. W.O.G.
¼ in. to 3 in.

LUNKENHEIMER VALVES

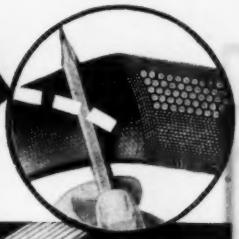
Here is Plain PROOF...

You can actually *feel* the sides of a belt *change shape* as the belt bends.

That the CONCAVE SIDE

(U. S. Patent No. 1813698)

SAVES Transmission DOLLARS



When a *straight-sided* V-Belt bends around a pulley, three things are bound to happen.

(1) The top of the belt, being under tension, *narrows*. (2) The body of the belt, under compression, *widens*. (3) The sides of the belt *bulge out*.

These *shape changes* are inevitable. They are shown in figures 1 and 1-A, below.

Straight-Sided V-Belt.

How Straight-Sided V-Belt Bulges in Sheave-Groove.

Because this bulging belt does not fit the sheave groove, two facts become clear. (1) The belt will get excessive wear where it bulges—*shorter life!* (2) The whole side of the belt cannot *uniformly* grip the pulley—*a loss in drive efficiency.*

How different the V-Belt with the precisely engineered *concave* side (U.S. Patent No. 1813698)—the Gates Vulco Rope. As this belt bends it assumes a shape that *exactly* fits the sheave groove. (Figures 2 and 2-A, below.)

Gates Vulco Rope with Concave Side.

No Side Bulge. Precise Fit in Sheave-Groove.

Two savings result. (1) The Gates Vulco Rope wears evenly—*longer life!* It's entire side-wall grips the pulley—no slip—*full delivery of power!*

The Mark of SPECIALIZED Research

The Concave Side is MORE IMPORTANT NOW Than Ever Before

Because the sides of a V-Belt are what actually drive the pulley it is clear that any increased load on the belt means a heavier load that must be transmitted to the pulley directly through the belt's sidewalls.

Now that Gates *SPECIALIZED* Research has made available to you SUPER Vulco Ropes—carrying fully 40% higher horsepower ratings—the life-prolonging Concave Side is naturally more important in conserving belt life today than ever before.

498

GATES VULCO ROPE DRIVES

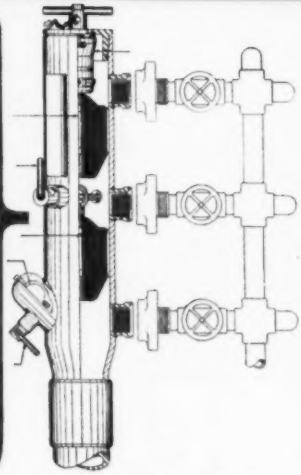
Engineering Offices and Jobber Stocks IN ALL INDUSTRIAL CENTERS of the U. S. and 71 Foreign Countries

THE GATES RUBBER COMPANY
DENVER, U.S.A.
"The World's Largest Makers of V-Belts"

HOW TO GET A Master CEMENTING JOB Every-time!

MAXIMUM CEMENT VOLUME THROUGH MULTIPLE INLET HEAD

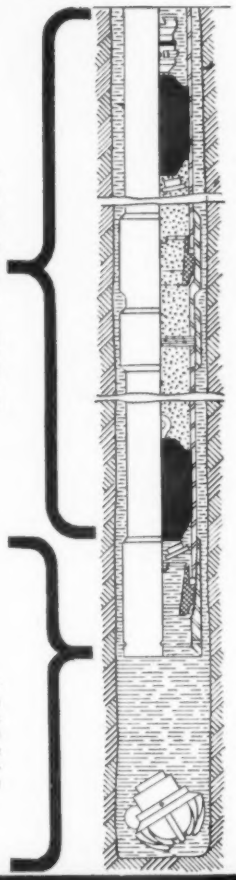
Provided with three inlets, the Rector "Fulbore" Cement Head has ample capacity to pump-in maximum volumes of cement as rapidly as desired. Providing a closed circuit, the Rector Cement Head prevents air from entering the fluid column; assures positive shut-in control throughout cementing operations. The Head, with the two plugs and trip ball is completely assembled before making up on the casing string. It is never opened after cementing operations begin. A positive means for dropping the trip ball, which ejects the float shoe assembly, and means for releasing the two plugs with practically no shut-down time is provided by the Rector "Fulbore" Cementing Head.



CEMENT SEGREGATED BETWEEN PISTON-LIKE PLUGS

The two plugs used with the Rector "Fulbore" Cementing Method have a piston-like fit in the casing string to completely and positively segregate the cement, thus preventing any possibility of contamination. These tightly fitting plugs swab and clean the inside of the casing, both ahead of and behind the cement. You are sure properly conditioned cement reaches the bottom of the hole.

The back pressure valve attached to the top plug securely and positively latches in the stall collar spaced the desired distance off bottom in the casing string. It prevents the back flow of cement and eliminates the necessity of holding pressure on the casing.



FULL CASING BORE DISCHARGE INTO CASING ANNULUS

By ejecting the entire float assembly from the Rector "Fulbore" Float shoe, the discharge area of the shoe is the same as that of the casing. This unrestricted opening reduces the load on the pumps by permitting the same volume to be circulated at lower discharge pressure. The uncontaminated cement enters the hole annulus at full casing discharge pressure.

BEFORE YOUR NEXT CEMENTING JOB ASK YOUR NEAREST RECTOR REPRESENTATIVE FOR FULL DETAILS ABOUT THE RECTOR "FULBORE" CEMENTING METOD.

RECTOR WELL EQUIPMENT CO., INC.
Fort Worth, Texas

Fort Worth Plant.....1100 N. Commerce St.
Houston Plant.....2215 Commerce St.
Export Sales: Champion and Smith, 10 Rockefeller Plaza, New York 20, N. Y.; 617 S. Olive St., Los Angeles, Calif.; Esperson Bldg., Houston, Texas

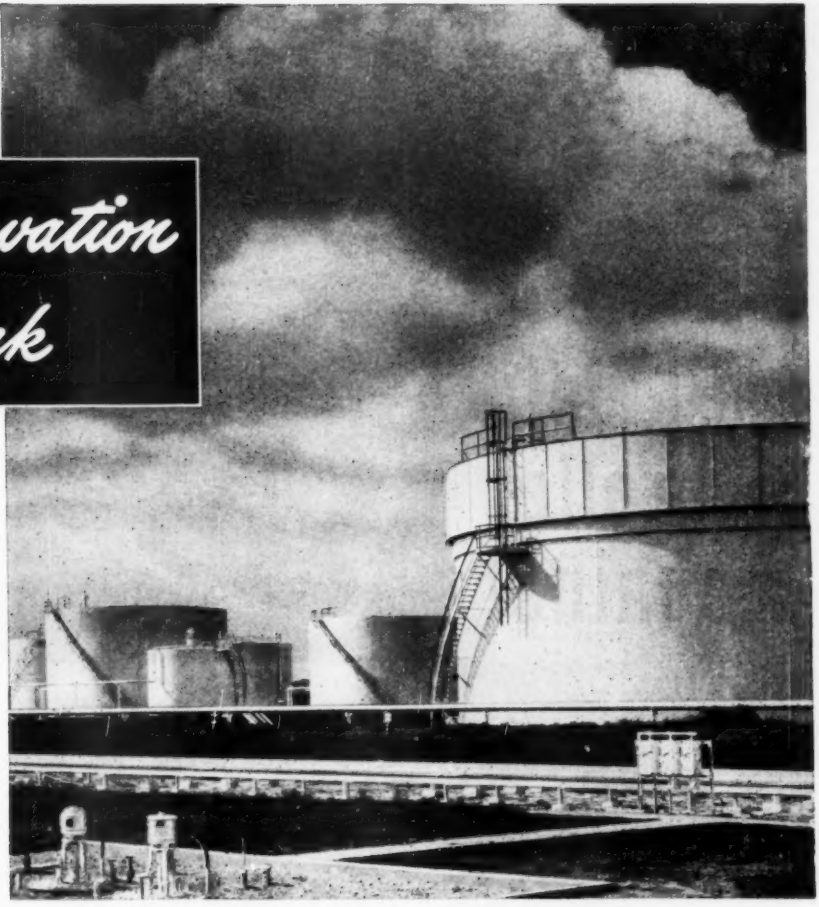
REPRESENTATIVES IN ALL ACTIVE FIELDS

This service and equipment available from Spartan Tool and Service Co.

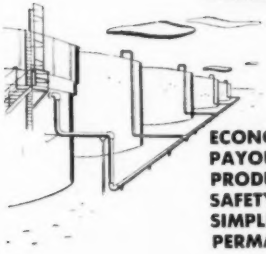
RECTOR FULBORE CEMENTING METHOD

ASK YOUR SUPPLY STORE FOR RECTOR "FULBORE" CEMENTING EQUIPMENT

Conservation at work



THE EXPANSION ROOF STOPS PROFIT LEAKS



Narrowing margins demand optimum operating economy wherever petroleum products are stored. That's why producers, refiners and marketers alike have turned to the Expansion Roof. Here's what it means to them:

ECONOMY . . . The end of evaporation losses
PAYOUT . . . Protection of multiple tank installations through manifolding
PRODUCT QUALITY . . . Maintenance of quality during the storage period
SAFETY . . . Reduced fire hazard, Underwriters' approved
SIMPLICITY . . . No problem of maintenance
PERMANENCE . . . No parts to wear. the Expansion Roof will last the life of the tank

In the face of narrowing margins, call on Graver today. Our engineers will analyze your storage problems without obligation and show you how the Expansion Roof can stop your profit leaks.

FABRICATED PLATE DIVISION

GRAVER

GRAVER TANK & MFG. CO. INC.
EAST CHICAGO, INDIANA

NEW YORK • PHILADELPHIA • CHICAGO • CATASAUQUA, PA. • HOUSTON • SAND SPRINGS, OKLA.

a great NEW development in oil field roller chains!

Heart of the new "BA" assembly, the single pin connector link. "Tear-drop" shape makes it easily identified on the job.

Single pin connector pin makes assembly and disassembly easy. Washer spun over one end makes a secure fit against one side plate. Pin is slip-fitted through chain except for the milled flat end which is press-fitted into a special hole in the other side plate. This end is then cottered.

This pin is press-fitted through chain and riveted on both ends. It holds chain parts together when assembling or taking apart chain.

easy to assemble . . . easy to take apart

New Baldwin-Rex "BA" Assembly Assures Long, Low-Cost Service

Baldwin-Rex "BA" Riveted Oil Field Roller Chain brings you all the advantages of riveted roller chain . . . longer service life and greater strength . . . plus even greater ease of field assembly and disassembly than with detachable roller chains.

The secret of the new "BA" assembly lies in the radically new single pin connector link. The "BA" assembly is made up in standard 5-foot units. Readily distinguished by its "tear-drop" shape, the single pin connector link is located at approximately the 2-foot mark and at the end of each 5-foot section of chain.

The single pin connector pin has one end spun over a washer. The other end has a milled flat and is secured with a cotter pin. This pin is a slip fit through the chain except for the milled flat end. This is press-fitted into a special hole in one single pin connector plate. Thus it is amazingly easy to drive out the pin without destroying the fits or damaging plates or bushings as it need only be driven the width of one side plate.

The other pin is press-fitted and riveted in both side plates. Thus when taking apart the chain or assembling, this pin holds the chain parts in place. There is no danger of side plates falling out, a particularly important advantage with multiple width chains . . . the advantages of riveted construction are retained throughout.

For the complete story, see your local supply store or write direct for your copy of Baldwin-Rex Oil Field Chain booklet.

BALDWIN·REX
ROLLER CHAINS

A complete line from ¼ inch to 2½ inch pitch
BALDWIN-DUCKWORTH DIVISION OF CHAIN BELT COMPANY
357 Plainfield Street, Springfield 2, Mass.

Published every Thursday by The Petroleum Publishing Co., 211 S. Cheyenne, Tulsa, Okla.

P. C. LAUINGER
President

S. H. ROURKE
Business Manager

HANSON B. PIGMAN
Circulation Manager

ADVERTISING
MITCHELL TUCKER
Manager

Houston Office
Sterling Building, Phone Charter 4626
WAYNE RIVES
Vice President, Gulf Coast Sales
JOHN M. SPEARS
Representative

New York Office
415 Lexington Ave., Phone Murray Hill 2-4852
CHARLES A. WARDLEY
Eastern Manager
ROBERT N. CAIRD, JR
Representative

Chicago Office
108 West Madison, Phone Central 6-2537
C. R. FARMER
Manager
E. S. KLAPPENBACH
Representative

Pittsburgh Office
429 Fourth Ave., Phone Atlantic 1-4835
ALFRED M. JONES
Representative

Tulsa Office
211 S. Cheyenne, Phone 3-6291
JOHN D. REILLY
Mid-Continent Manager
J. PARKER HOLLAND
Production Manager

Los Angeles Office
650 S. Grand Ave., Phone Vandike 0723
DONALD O. HANSON
Manager

England Office
111 Thorley Lane, Timperley, Cheshire
HARRY BECKER
European Representative

Member
Audit Bureau of Circulations
Associated Business Papers

JOURNALLY Speaking

Drake's Pass

EVERY oil man knows that the first oil well in the world was brought in by a Colonel Drake 90 years ago this week. Lots of books have been written about it.

What intrigues this department is the part played in that epochal event by hunch, chance, luck, improvisation, and necessity—even as today. Our own vast historical research permits us to report a few examples of this.

Pennsylvania "rock oil" was an article of commerce before Drake. Skimmed from springs and salt wells, it brought a high price as a cure-all medicine. One Connecticut user thought this would be a good racket to get in on so he organized a firm to exploit some well-known oil springs near Titusville, Pa. But he couldn't afford a ticket to Pennsylvania, so he cut in Edwin L. Drake, a railroad conductor who had a pass and could ride free. This seems to have established a tradition of wildcatting on a shoestring.

Drake's plan was to dig pits around the springs from which to bail the oil, but the ground kept caving in. In desperation he called on a salt-well driller who was experienced in "deep" (50 ft. or so) holes. They "invented" casing through the necessity of having to drive a pipe into the swamp to protect their hole.

They didn't get a gusher—never heard of one—but at 69 ft. they were able to bail enough oil to break the medicine market, and they were happy.

That would have been just about the whole history of the oil industry except that about that time whales began getting scarce. A substitute illuminating oil made from bituminous coal was bringing fancy prices, and the petroleum-medicine men thought they might add a profitable sideline by breaking into the "coal oil" business.

Run through a coal still, the rock oil yielded a lamp oil better than that from coal and more profitable to the sellers. Then the boom began, and oil became an industry in a direction and degree totally unexpected by Drake and his impecunious backers.

As for Drake, about all he got out of it was the honorary title of colonel and the knowledge that his railroad pass carried him to a firm niche in history as the man who drilled the first commercial oil well in the world.

Missing Fields

ANYONE know of an old gas field suitable for patching up to use for summer storage? If so, please notify Max W. Ball. He collects 'em.

Max, who wrote "This Fascinating Oil Business" and later was director of the Oil and Gas Division, is now an oil and gas consultant in Washington. At the American Gas Association convention in French Lick last May he gave a paper on "Underground Gas Storage" in which he listed 80 storage fields in use and 14 being prepared for use.

Now he finds that he missed at least three fields and he suspects there may be still more of them hidden away underground some place. He asked the help of this department in requesting people in the industry to notify him of any others he may have missed, and while we are not exactly a lost-and-found department we are glad to help out. So far as we know, no reward is offered except Max's smile, but that's a pretty good one.

Union Forever

THE current Drake Well celebration seems to have set the whole industry to thinking of its origin.

Out on the West Coast, where the oil industry will be 80 years old in 1950, Union Oil Co. of California has gone into the history business by donating its first office building in Santa Paula as a public museum for housing relics of early California petroleumiana. This, it is hoped, will perpetuate the history of oil and Union forever.

—Henry D. Ralph

INCREASE DURABILITY... MINIMIZE REPLACEMENTS

of Cast Parts in Oil Field Equipment

by using

NICKEL ALLOY STEEL CASTINGS

THIS "CHRISTMAS TREE" CARRIES PEAK LOADS

Here are flanged crosses, tees and fittings of cast nickel-chromium-molybdenum steel, produced by Los Angeles Steel Casting Co., Los Angeles, for Regan Forge & Engineering Co., San Pedro, Calif. After normalizing and drawing at 1200° F., these castings show:

Tensile Strength, p.s.i.	100/110,000
Yield Point, p.s.i.	75/85,000
Elongation in 2", %	18/22
Reduction of Area, %	35/45
Brinell Hardness	200/235

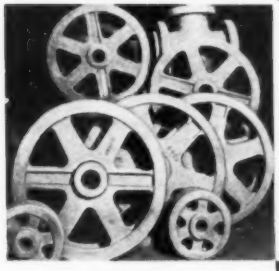
ADVANTAGES

of Alloyed Over Plain Carbon Steel Castings

1. STRONGER . . . HIGHER YIELD STRENGTH
2. LESS BULK and DEADWEIGHT
3. HARDER . . . MORE WEAR-RESISTANT
4. BETTER RESPONSE TO HEAT TREATMENT
5. GREATER SHOCK-RESISTANCE
6. GREATER FATIGUE STRENGTH
7. LESS EMBRITTLEMENT AT SUB-ZERO TEMPERATURES

Nickel alloy steel castings have excellent wearing qualities and withstand combinations of severe static and dynamic stresses. Applications include:

Brake drums	Core tube pullers
Pump bodies	Slush pump valves
Crown block sheaves	Bit bodies and cutters
Traveling block sheaves	Slush pump liners
Drilling valves and fittings	Draw works gears and sprockets



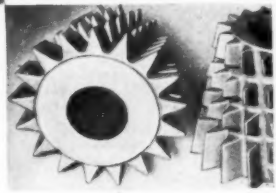
BUILT FOR LONG, DEPENDABLE PERFORMANCE

These gear blanks for pump units were cast in nickel-chromium-molybdenum steel by Texas Electric Steel Casting Co., Houston, Texas, for Lufkin Foundry & Machine Co., Lufkin, Texas. The castings were quenched and drawn to provide:

Tensile Strength, p.s.i.	105,000 min.
Yield Point, p.s.i.	75,000
Elongation in 2", %	22
Reduction of Area, %	55
Brinell Hardness	260-290

CAST NICKEL ALLOY STEEL STANDS THE GAFF

These case-hardened rock bit cutters were cast in a steel equivalent to 4615 type (nickel-molybdenum steel) by Westelectric Castings, Inc., Los Angeles, Calif. They exemplify use of nickel alloy steel castings for service which demands materials far above average in strength, hardness, toughness and dependability.



MAIL THIS COUPON NOW FOR FULL INFORMATION

The International Nickel Company, Inc.
Dept. 000, 67 Wall St.,
New York 5, N.Y.

Please send me your 32-page booklet entitled "NICKEL ALLOY STEEL CASTINGS IN INDUSTRY"

EMBLEM OF INCO SERVICE

Name ..... Title .....

Company .....

O.&G.J. 8-25-49

Address .....

City ..... State .....

THE INTERNATIONAL NICKEL COMPANY, INC. 67 WALL STREET NEW YORK 5, N.Y.

the OIL AND GAS JOURNAL

FOUNDED IN 1916 BY PATRICK C. BOYLE

VOL. 48, NO. 16 AUGUST 25, 1949

EDITORIAL STAFF

C. O. WILLSON
Editor

Kenneth B. Barnes — Engineering Editor
Henry D. Ralph — News Editor
George H. Weber — Refining Editor
415 Lexington Avenue, New York City
Paul Reed — Pipe Line Editor
W. L. Nelson — Technical Editor
Lynn M. Nichols — Associate Editor
Neil Williams — Associate Editor
Charles J. Deegan — Associate Editor
R. B. Tuttle — Associate Editor
C. Dudley Johnston — Staff Artist

DISTRICT EDITORS

Dahl M. Duff — 415 Lexington, New York City
Ted A. Armstrong — 211 S. Cheyenne, Tulsa
Roy F. Carlson — 211 S. Cheyenne, Tulsa
John C. Casper — 211 S. Cheyenne, Tulsa
Robert Harwick — 650 S. Grand, Los Angeles
Carl F. Hoot — Mercantile Bank Bldg., Dallas
Victor Lauriston — 35 Stanley Ave., Chatham, Ont.
Bertram F. Linz — 621 Albee Bldg., Washington
Leigh S. McCaslin — Sterling Bldg., Houston
John C. Reidel — 211 S. Cheyenne, Tulsa
William P. Sterne — 211 S. Cheyenne, Tulsa
D. H. Stormont — Mercantile Bank Bldg., Dallas
Polly DeArmond — Editorial Assistant, Tulsa

CORRESPONDENTS AT

Denver, Colo. — Calgary, Alta.
Pittsburgh, Pa. — Ashland, Ky.
Columbus, Ohio — Oil City, Pa.
Mount Pleasant, Mich.

Subscription rate to the petroleum industry, United States and foreign, 1 year, $3.00. Single copies, 50 cents. Back copies when over a year old, one dollar. Note: Payments from outside the U.S.A. may be in the form of an international money order or check on a U.S.A. bank. Entered as second-class mail matter at Tulsa, Okla., under Act of March 3, 1879. Copyright 1949 by The Petroleum Publishing Co.

In This Issue

News

Pluses, Minuses Found in Study of Industry's Short-Term Outlook 74
Free Enterprise Can Find Vast Hidden Reserves, Levorsen Says 75
Krug Says U. S. Investors Hold Key to Foreign Development 75
Texas Hikes Allowable 132,268 Bbl. in First Increase of 1949 76
Kansans Air Grievances, Urge Strict Control Over Imports 78
Bill Providing for National Oil Policy Is Introduced in House 79
Field Hearings on Gas Law Planned in Texas 79
Texas, Louisiana Attack Seven Points in Federal Tidelands Bill 80
House Winds Up Study of Acquired-Lands Bill 80
Engines to Burn Variety of Oil Fuels Needed, Sims Says 82
AGIP Adds Two Producers in Po Valley, Asks State Monopoly 85
Kirkuk-Tripoli 16-In. Line Begins Operation 85
World Production Off 92,600 Bbl. Daily in June; Upturn Seen 86
Equipment to Begin Oil Search in Southern Mexico Readied 89
Russian Output Way Up, Says Russia 89
New Firm to Construct Refinery in Puerto Rico 89
Syrian Revolt May Not Delay Tapline Progress 90
Good Well Completed in Germany's Hanover Area 90

Engineering-Operating

New Chemical Treatment of Flood Water 96
Propane Recovery Increased from 68 to 92 Per Cent 101
Horizontal Water Well Supplies 2,500 Bbl. Daily 106
Laboratory Machine Shop Plays Vital Role in Research 108
Highest Barrel-per-Acre Recovery in Rocky Mountain Area 111
Gas-Turbine-Driven Pumping Unit 115
Course Prepares Students for Skilled Jobs in Oil Industry 118
Guide Charts in Development of Ground-Water Supplies 122
New Hydraulic Rigs Ready for Field Tests 128
Revised Depropanizer Instrumentation Improves Plant Operation 132
Questions on Technology 139
Engineering Fundamentals—Equilibrium Constants 141
Cost-imating—Refinery Valves 143

Exploration-Development

Canada's Deepest Producer Is Largest Gasser 161
Highlights of Week's Developments 161
Reports by Areas Start on Page 162
Deeper Wells Drilled With Fewer Rigs During First 7 Months 179

Departments

Journally Speaking 69
Editorial 73
This Week 77
Watching Washington 81
International News 85
Personals 93
Deaths in the Industry 95
Refining News 145
Natural-Gas News 148
Natural-Gasoline News 148
Pipe-Line News 151
Drilling Contractors 157
Exploration Statistics 180
Production Statistics 181
Refining Statistics 182
Market Statistics 183
Equipment Men in News 184
Classified Advertising 186
Calendar of Events 190
Advertisers' Index 190

You're right...

to want the best equipment for testing, acidizing, plasticizing, squeeze cementing —all of which are vital operations in well completion.

That's why you should use the Baker Model "RT-8" Retrievable Cementer, to provide a safe, positive device for...

- ***testing casing, or locating holes in pipe;***
- ***placing cement, plastic, acid, or any other fluid, at any necessary pressure, behind the casing or liner through perforations, or in open hole below the shoe;***
- ***setting in lime formations for acidizing or squeeze cementing;***
- ***pressure testing the effectiveness of a previously performed cement job.***

The Baker Model "RT-8" Retrievable Cementer (Product No. 411RT) is operated mechanically and is not dependent upon fluid pressure to set or release. It functions successfully in high-pressure wells, and will withstand with ample safety any pressure that may be imposed upon the well casing. It operates with equal efficiency and safety in low-pressure or low fluid level wells.

In addition to the obvious advantages of a "Retrievable" tool the Baker Model "RT-8" Retrievable Cementer has these outstanding features:

RUNS IN FAST—From 1 to 4 hours time is saved over the time required to run in a cementer equipped with swab cups;

RUNNING-IN STRING WILL NOT FLOW OVER while a Baker Cementer is being run-in hole at reasonable speed;

PERMITS CIRCULATING THE LONG WAY;

FUNCTIONS EFFICIENTLY IN LOW FLUID LEVEL WELLS as well as in high pressure wells;

PERMITS TESTING CASING, or protecting casing during squeeze job, by applying reasonable pressure to the annulus after cementer is set;

WITHSTANDS ANY PRESSURE below the cementer that is safe for the well equipment;

MAY BE ROTATED OUT OF THE HOLE—When the cementer is ready to be retrieved from the hole, rotation to the right will lock the slips in retracted position, thus preventing setting while coming out of the hole;

CIRCULATION POSSIBLE IF PACKING UNIT STICKS by means of a Circulation Joint above the cementer;

RELEASES IN EMERGENCY—Contains safety thread for quick release.

You can depend upon the Baker Model "RT-8" Retrievable Cementer

BAKER OIL TOOLS, INC.
Houston • Los Angeles • New York

It's the Best

THE OIL AND GAS JOURNAL

The Drake Message

NEXT Saturday a representative citizenry will observe the ninetieth anniversary of the Drake well. Rather belatedly the entire nation is coming to realize that the successful completion of the first oil well ranks in importance with the outstanding industrial discoveries of all time.

Local and national organizations of the oil industry and its public-relations organization have brought the occasion to the attention of the public everywhere. With the hundredth anniversary in the offing, it would seem that the industry should give thought to how it might further emphasize the significance of an event now memoralized in an attractive park and museum at the well site, to the end that petroleum's beginnings shall not be forgotten in the rush of these times.

Quite properly many comments this week are emphasizing the dominant part that petroleum has had in the industrial and social development of this country. This year, within our continental boundaries, the average per capita consumption will be in the order of 15 bbl. or 630 gal. The intrepid drillers of the Drake well were thinking in terms of a market confined to medicinal uses and the needs of a fortunate few who could afford oil light.

But aside from what petroleum has meant and will continue to mean on an expanding scale in this country, the place that it will have in the rest of the world probably will be more important over the next 90 years.

Up to now petroleum essentially has been an American enterprise. More than 60 per cent is still produced in this country and our percentage of total consumption is slightly greater. No country approaches the 630-gal. average of continental United States. Canada, our friendly neighbor to the north, is closest but its present needs are only about half those of this country. The average petroleum requirements of the 50 million people of the United Kingdom are estimated to be 2 bbl. yearly or 13 per cent of ours. Over a large part of the world, applying to more than 50 per cent of its population, the average demand amounts to a few gallons yearly. In these dark areas petroleum does not touch directly a sizable percentage of the population.

There are several reasons for this widely varying petroleum use in which nearly two-thirds of the consumption is accounted for by 7 per cent of the world's population. One reason—lack of economic supply—is ending rapidly with the discovery of major reserves outside the United States.

What petroleum can do in expanding agricultural and industrial production and expansion of transportation has been demonstrated in Western Europe and other foreign points since the war's end. The task ahead is to widen these applications everywhere and continue them after they are divorced from American aid. That, we feel, is the principal message of the Drake well on this ninetieth anniversary.

The Petroleum Situation September 1

Pluses, Minuses Found in Study of Oil Industry's Short-Term Outlook

by John C. Casper

THERE are two major questions confronting the entire oil industry at the end of the summer season this year.

Are we reaching the end of the readjustment period that has followed the big postwar gains?

Will petroleum demands return to the normal upward trend?

The summer season in 1948 followed a cold winter with high demands for heating oils. All resellers and consumers were rushing to fill all available storage for the coming winter. Gasoline demand was good. Production and refinery runs were increasing rapidly. By the middle of August it was evident that increased supply would be sufficient to cover demands. *(See "Oil Shortage Over; Figures Show Stocks of All Products Gaining," The Oil and Gas Journal, August 19, 1948, page 58).*

At the end of April this year total stocks were 121,000,000 bbl. higher than the year before. Mild winter weather in the high-demand areas in the North and East had reduced distillate consumption. Lagging heavy-fuel demand was followed by sharp reductions in residual prices. High inventories produced weak distillate markets. Resellers and consumers, expecting further declines in fuel prices, failed to follow the normal pattern of summer purchases for storage. Crude production and refinery runs were reduced while imports remained high.

Pluses, Minuses Listed

Thus, we come to the end of August and each operator will need to add up the plus-and-minus signs to make a decision on the short-term outlook for his part of the industry. Here are some of the more important ones.

Recent trends toward a firming distillate market in the Gulf Coast area resulted in a .25 cent per gallon increase in the price of No. 2 fuel at the middle of the month. This strengthening in the Gulf Coast area has followed increased movements to the consuming areas in the northeast. This first increase in distillate prices may be the turning point in the market for home-heating fuels.

In the area east of California, there has been an upturn in the heavy-fuel market. Reductions in residual prices have made heavy fuel competitive with coal on a B.t.u. basis. Recent uncertainties in the coal supply for this winter have brought many heavy-industry changes to residual fuel.

The gasoline market has been very good during the vacation season. Prices have remained steady and sales have been running well above last year.

All published forecasts indicate record demands during the last quarter of this year and the first months of next year. Estimates by E. T. Knight *(The Oil and Gas Journal, July 28, 1949)* place fourth-quarter demands at a level that is 8.9 per cent above the same quarter last year. His forecast for the first quarter of 1950 is 10.7 per cent above the first 3 months of this year.

The recently released Bureau of Mines forecast predicts an increase of 8.4 per cent in total demand for the last quarter of this year, enough to raise the average for the year by 1.6 per cent over 1948.

High Gasoline Demand Seen

Gasoline demand for the year is expected to be about 6 per cent greater than last year to pace the over-all gain in consumption.

The automotive industry is still delivering motor vehicles against a backlog of demand left over from the war period and does not expect to meet all of these demands before the first of next year. Factory sales in the domestic market during the first half of this year were about 25 per cent greater than last year. Total motor vehicle registrations continue to climb. More cars will be on the road at the beginning of vacation season next year than at the start of the past season.

For many years there has been a gradual change in seasonal demand for motor fuel, shifting toward a higher percentage of consumption during the winter months. If weather is near normal this winter, gasoline demand should be well above last year in the last quarter of this year and in the first quarter of 1950.

Barring a pronounced business slump by next spring, gasoline consumption during the 1950 vacation season should set new records.

Distillate Sales to Rise

Distillate demands in the first 6 months were about 10 per cent below last year because of the warmer-than-normal weather last winter and the shortage of fillup sales to resellers and consumers during the early summer months. The first represents an actual loss in consumption but the low indicated demand for the past few months will be balanced by the big jump in sales that must come before cold weather.

Oil burner sales are better than last year with some forecasts indicating that burners in operation this winter may be as much as 8 per cent above last season. Diesel oils and other non-heating distillates are continuing a sharp upward demand trend. It would follow that even with mild weather again this winter, distillate demands will be well above last year. If the weather is near normal, these increases are projected at about 20-25 per cent.

Total distillate inventories, including primary, reseller, and consumer stocks, are believed to be lower than they were at this time last year. *(See "Trends," The Oil and Gas Journal, August 4, page 25).*

Reference to the stock charts in the statistics section of this issue will show that inventories of all major products are nearer the 1948 level than they were at the end of the first quarter. Crude stocks have declined after reaching a peak near the end of May.

Crude Output May Set Record

Crude production, needed to meet the demand in the first quarter of 1950, may be higher than the record-setting output in the last quarter of 1948.

The current result of brighter prospects for higher petroleum demand is the increase in September allowable granted by the Texas Railroad Commission. The number of producing days was raised from 17 to 18 to give an increase of about 132,000 bbl. daily.

The most troublesome problem on the minus side of the ledger is the squeeze that has resulted in such a drastic cut in refinery profits. There were two major causes for this cut. The refiner has been caught between stable crude prices and declining product prices. He also has had to assume the additional burden of stor-

(Continued on page 177)

Free Enterprise Can Find Vast Hidden Reserves, Levorsen Says

by Dahl M. Duff

LAKE SUCCESS.—The world's undiscovered petroleum reserves are abundant and the problem is largely one of providing a healthy political and economic climate to stimulate discovery, Dr. A. I. Levorsen, Stanford University, told the United Nations Scientific Conference on the conservation and utilization of resources August 22 at Lake Success, N. Y.

Known proved reserves now approximate 70 billion barrels, while current estimates indicate total undiscovered reserves are on the order of 1,500 billion barrels, Dr. Levorsen said.

Dr. Levorsen pointed out that geologically the United States appears no more favorable for petroleum accumulation than many other areas of the world. Yet thousands of oil and gas fields have been found, and, he said, this is due to the fact that the free-enterprise, profit-incentive system is the most effective in the search for new oil deposits.

"Undiscovered reserves in a region of adverse political or economic climate will tend to remain undiscovered, and thus are of only academic interest," he told the conference delegates.

Dr. Levorsen said the most promising regions of the world for the discovery of substantial new petroleum reserves are in and adjacent to those provinces already producing. "More is known of the underground conditions of these areas; more drilling is being done; and the opportunities for discovering deeper sands, lateral extensions, and unforeseen conditions are much greater," he said. The Stanford University mineral-sciences dean was the principal speaker at the only plenary session of the conference dealing directly with the petroleum industry. The conference continues until September 7, and three other sectional meetings later deal with oil exploration and production and petroleum chemistry.

In the discussion following Dr. Levorsen's paper, L. G. Weeks, research geologist, Standard Oil Co. (N. J.), warned that the figures on discovered reserves, many of which he has compiled, should not be used in the same sense as those of known reserves. As an example of the need for caution in using the figures, he said, it is entirely likely that 80 per cent of the undiscovered oil and gas is contained in only 20 per cent of the world's sedimentary areas.

Andrew B. Crichton, Johnston Coal & Coke Co., took issue with the figures on both coal and oil reserves in the United States, declaring there was not 10 per cent of what the U. S. Geological Survey estimated. He also deplored the "ruthless competition" between oil and coal which he said was allowing fuel oil to be sold in New York $1 below the cost of crude and causing the closing of many coal mines.

Krug Tells Scientists U. S. Investors Hold Key to Foreign Development

LAKE SUCCESS.—J. A. Krug, secretary of the interior, held out the possibility of substantial United States aid for the under-developed regions of the world here last week in a speech at the opening meeting of the United Nations Scientific Conference of the Conservation and Utilization of Resources.

Referring to President Truman's Point IV proposal, the secretary told the 300 scientists and officials at the international conference that the President "intends, when programs are ready, to obtain substantial help for those areas, both in technology and in investment." These regions, he added, need help, and the entire world will benefit.

Later, Krug said that the assistance of the United States toward the more economically backward regions would be limited to exploratory studies, but he said he had been informed there was $300,000,000,000 available from American investors provided the institutional climate and political atmosphere was proper.

In his address, Krug said the underdeveloped regions cannot "lift themselves by their bootstraps" and must have a vigorous push, frequently from the outside, before any substantial economic development can get under way. These underdeveloped areas, he continued, are not alone to blame for their predicament. They need help from the outside — understanding, technology, and investments. "The viscious circle of no capital and no development must and can be broken," he said.

Another essential to economic development on a major scale is an institutional climate that favors it, the secretary said. This means a general understanding that wealth is created only by increasing production and that no real economic progress can be achieved on a high-cost, small-sales basis.

"There must be investment, some of it in the form of risk capital," he said. "Those who use the capital must understand their responsibility toward the lenders, whether the investment be private or public. There must be an equal acceptance of responsibility on the part of those who lend. They must know that no great economic progress can be started with high interest rates and excessive profits."

Krug named a number of problems which he said are examples of opportunities to use the world's scientific and engineering "know-how" to raise the standard of living and add to world resources. Among them were: more effective utilization of solar energy; development of synthetic fuels, particularly from oil shales; development of hydroelectric power to conserve oil, gas, and coal; and further development of improved space heating in cold weather and cooling in warm weather.

The conference, sponsored by the U.N.'s Economic and Social Council, will continue through September 6. Fuel and energy, including petroleum and natural gas, constitute one of the main sectional topics along with land, forests, and water.

Bill Canceling Refiners' Premiums Goes to Truman

WASHINGTON. — Only President Truman's signature is needed to wipe out the premium payments which the Interior Department has been collecting since 1947 on royalty oil sold to independent refiners under the O'Mahoney Act.

Under the O'Mahoney Act, passed when crude supplies were exceedingly tight, small independent refiners with no assured sources of crude were given a preference in buying royalty oil from the public lands. The oil was put up at auction and went to the bidder of the highest premium over the posted price.

As the supply situation improved last year, refiners who had taken contracts for a 3-year term found that the premiums were pushing their crude costs so far above the market that they were faced with severe losses. Legislation was accordingly introduced which not only would waive the collection of further premiums but would credit those already paid to the account of the refiners.

Texas Hikes Allowable 132,268 Bbl. in First Increase of 1949

by D. H. Stormont

MINERAL WELLS.—An increase of 132,268 bbl. daily over Texas' current oil production was ordered by the Railroad Commission last week for the month of September.

The Commission order set the daily crude-oil allowable at 2,077,905 bbl. for the month. The increase was effected by adding one producing day in all Texas fields, bringing the East Texas field up to 16 days and the remainder of the state to a total of 18 producing days.

Testimony offered by representatives of crude-oil producing and purchasing companies at the proration hearing largely was to the effect that the July-August allowable was at about the right level but that one additional producing day in September could be readily absorbed.

Industry Optimistic

Most of those testifying were optimistic regarding demand in the final quarter of the year. Two spokesmen asked that two additional days be given in September. The majority, however, felt it would be better to add only one day next month and then in October, when demand for burning oils would be stronger, an extra day could be scheduled.

The new allowable represents the first increase in 1949. It follows seven consecutive production cutbacks over an 8-month period. The new allowable of 2,077,905 bbl. still is 596,634 bbl. below the net crude allowable of 2,674,539 effective during December.

Texas' new allowable is 52,095 bbl. daily under the Bureau of Mines estimated demand for Texas crude during September. The Bureau set its estimate at 2,130,000 bbl., or 20,000 bbl. daily under its August estimate.

Purchaser nominations for September were for 2,365,597 bbl. daily, an increase of 48,066 bbl. over August levels.

Total Output Estimated

Total state production of liquid hydrocarbons is expected to approximate 2,311,426 bbl. daily as it is anticipated output of natural gasoline and distillate will be about 233,521 bbl. daily.

The September allowable by districts, and changes from the daily allowable for the week ended August 13 are shown in the accompanying table.

Much of the testimony at the hearing was relative to the crude-oil and products inventories of the various purchasing companies and to their current imports and expected rate of importing during the remainder of the year.

SEPTEMBER ALLOWABLE, BY DISTRICTS

District—	September allowable (bbl.)	Increase (bbl.)
1—Southwest	29,773	772
2—Southwest	124,808	9,991
3—Gulf Coast	384,845	28,252
4—Southwest	193,533	12,167
5—East Central	35,829	2,683
6—Eastern Texas	87,865	5,963
6—East Texas field	245,138	21,593
7-B—West Central	71,000	2,119
7-C—West Central	52,397	2,168
8—West Texas	573,679	41,435
9—North Texas	169,193	4,792
10—Panhandle	109,905	13
Total	2,077,905	132,268

Little evidence was gathered in the roll-call of the various districts, with the exception of East Texas field. Joe Zeppa, independent operator and drilling contractor of Tyler, asked that East Texas field be given 20 producing days or that it at least be placed on an equal basis with the rest of the state. He contended that the field is being treated unfairly, that the low rates of oil production are causing west-side operators to lose oil to those on the east side.

H. L. Phillips, president of Sinclair Oil & Gas Co., was one of the most optimistic of the purchasing representatives. He said that Sinclair Oil Corp. was withdrawing from storage at the rate of 15,000 bbl. daily and that it could absorb its share of a 2-day increase in Texas allowables.

IMPORTS PLANNED BY OPERATING COMPANIES FOR LAST 4 MONTHS*

Company and kind—	Sept.	Oct.	Nov.	Dec.
Sun Oil Co.:				
Crude	7,500	7,500	7,500	7,500
Standard Oil of Indiana:				
Crude and asphalt	9,590	9,590	9,590	9,590
Standard Oil of New Jersey:				
Crude	90,000	90,000	90,000	90,000
Shell Oil Co.:				
Asphalt	6,000	4,500	3,200	2,700
Residual	8,000	8,000	8,000	8,000
Crude	8,000	8,000	8,000	8,000
Total Shell	22,000	20,500	19,200	18,700
Standard Oil of California:				
Asphalt	22,000	22,000	23,800	23,800
Gulf Oil Corp.:				
Crude	93,000	93,000	93,000	93,000
Sinclair Oil & Gas Co.:				
Crude	28,750	24,800	24,300	28,159
Atlantic Ref.:				
Crude	43,700	37,300	32,800	32,800
Socony-Vacuum:				
Crude and products	75,700	72,700	73,400	68,500
Texas Co.:				
Crude	54,333	52,581	58,833	57,742
Total	446,573	429,971	432,423	429,791

*Results of Railroad Commission telegraphic survey.

Humble to Draw on Storage

A. J. Neath, of Humble Oil & Refining Co., said his company has on hand about 3,000,000 bbl. less than the record 19,000,000 bbl. of crude stocks in storage in July. He said Humble expected to make substantial drafts from this storage during this month and in September. He believed an extra day would be sufficient for September.

Other spokesmen asking for an additional day of production were: Millard Moore, Sun Oil Co., Beaumont; W. G. Noble, Magnolia Petroleum Co., Dallas; E. D. Cumming, of Shell Oil Co., Inc., Houston; and L. S. Wescoat, Pure Oil Co., Chicago. Noble, Magnolia vice president, said that even with an increase of 1 day in September, his company would continue to draw on crude stocks which have declined about 1,500,000 bbl. in recent months.

Ralph Dietler, board chairman of Stanolind Oil Purchasing Co. and also representing Standard Oil Co. of Indiana, said that under the existing allowable it would be necessary for Stanolind to sell some 30,000 bbl. of West Texas sour crude daily if pipeline proration were to be prevented. Any additional days given in September, he testified would add about 4,000 bbl. to the total for each day added.

Phillips Favors Status Quo

Another major crude-oil buyer expressing reluctance for an extra day's production was C. R. Musgrave, of Phillips Petroleum Co., Bartlesville. He felt there was still too much crude above ground but that Phillips would not oppose an increase in production.

In connection with imports of crude oil and refined products, Commissioner E. O. Thompson introduced into the record the results of a telegraphic survey of the importing companies. The survey showed that 10 companies expect to import an average of 446,573 bbl. daily during September, 429,971 bbl. in October, 432,423 bbl. in November, and 429,791 bbl. in December. His questioning of company spokesmen revealed The Texas Co. had increased its imports of Venezuelan crude some 15,000 bbl. daily and Gulf Oil Corp., about 11,000 bbl.

The amount of imports planned by these 10 companies over the remainder of this year may be found in the accompanying table, compiled by the Railroad Commission.

this week

RESERVES—Dr. A. I. Levorsen tells United Nations Scientific Conference current estimates place world's undiscovered oil reserves at 1,500 billion barrels, compared with known reserves of 70 billion barrels. . . . Problem in development, he says, is to provide healthy political and economic climate to stimulate discovery. . . . L. G. Weeks urges caution in using estimate, saying 80 per cent of new reserves may be contained in only 20 per cent of the world's sedimentary areas. . . .

GOVERNMENT—Legislation creating a national oil-policy committee is introduced in House. . . . ¶Texas Railroad Commission plans field-by-field hearings on new gas-measurement law. . . . ¶Bill canceling premiums paid by small refiners for government oil goes to President Truman. . . . ¶Louisiana, Texas officials open fire in Washington on objectionable features of tidelands bills introduced in Congress. . . . ¶President Truman says Mexican loan negotiations still not dead. . . .

IMPORTS—House investigators told excessive imports hurting producers, refiners, and drilling contractors in Kansas and affecting state's entire economy. . . . Corporation Commission Chairman Jeff Robertson describes imports as "threat to . . . the very existence of the small businessman. . ." . . . . Governor Carlson tells House members continued imports threaten "far greater injury." . . .

INTERNATIONAL—World-wide crude-oil production shows downward trend in June, paced by reductions in the Middle East and the United States. . . . ¶New 16-in. Kirkuk-Tripoli line of Iraq Petroleum Co., Ltd., goes into initial operation, delivering about 40,000 bbl. daily. . . . Deliveries expected to reach 90,000 bbl. daily by end of the year. . . . ¶AGIP announces completion of two wells in Upper Po Valley. . . . Government agency asks state oil monopoly. . . . ¶Russian Embassy announces current Soviet production is double that of 1945, but fails to indicate what 1945 output was. . . . ¶Engineering work begins on 25,000-bbl. refinery to be built in Puerto Rico. . . . ¶Shipload of equipment to be used in exploratory work in southern Mexico to leave Houston this month. . . . ¶I.P.C. completing atmospheric topping unit at Tripoli refinery. . . . To be in operation in September or October.

PIPE LINES—Stanolind Pipe Line Co. announces details on six major projects now under way. . . . ¶Arkansas-Louisiana Gas Co. lets contracts for 163-mile, 20-in. line from Waskom, Tex., to Malverne, Ark. . . . ¶Pipe for Salt Lake Pipe Line Co.'s 560-mile project from Salt Lake City to Pasco, Wash., scheduled for delivery this week. . . . ¶Reports say Interprovincial Pipe Line Co. may run its proposed Edmonton-Regina crude-oil line to point near North Dakota border. . . .

TRENDS—Stocks of four major products in all areas east of California were 50,000 bbl. less on August 13 than they were 4 weeks earlier. . . . Gasoline stocks were down 3,748,000 bbl. and residual down 1,315,000 bbl. . . . Kerosine stocks increased 1,553,000 bbl. and distillate gained 3,460,000 bbl. . . . ¶In the same period last year stocks east of California increased 9,734,000 bbl. . . . Product changes include gasoline, down 3,138,000 bbl.; kerosine, up 1,812,000 bbl.; distillate, up 7,489,000 bbl.; and residual, up 3,571,000 bbl. . . . ¶The recent firming of the distillate market in the Gulf Coast area has been followed by increases in price for No. 2 on the East Coast. . . .

REFINING—Salt Lake Refining Co. awards contract to Bechtel Corp. for construction of new 10,000-bbl. Houdriflow unit at Salt Lake City refinery. . . . ¶Labor dispute shuts down work at Panhandle Producing & Refining Co.'s Wichita Falls, Tex., refinery-expansion project. . . . ¶Negotiations reported under way between union and company officials at struck Crown Central Petroleum Corp. refinery at Pasadena, Tex. . . .

Gulf Coast geologists and production men are greatly interested in this shallow discovery made last week by Freeport Sulphur Co. in the Bryan Mound area of Brazoria County, Texas, 60 miles south of Houston. The well flowed 34°-gravity crude from 1,388 ft. at a rate of 54.99 bbl. daily on a Railroad Commission potential test. Gulf Coast operators found the high gravity hard to explain, since the pay is in sediments of recent geologic age, and found the shallow depth equally interesting

Kansans Air Grievances, Urge Strict Controls Over Imports

WICHITA, Kans. — House members investigating the imports situation were told here last week that excessive imports constitute a major business handicap for small producers and refiners, drilling contractors, and equipment manufacturers in Kansas and are affecting the state's entire economy.

They were told, for example:

That imports forced a reduction of 55,000 bbl. daily in the state's allowable;

That these cutbacks in permitted production discouraged exploratory work and that the number of active rigs has dropped from between 150 and 160 to 114;

That sales of production equipment in Kansas during the first half of this year were 11.6 per cent below those of the same period in 1948; and

That unregulated imports are hampering the effective administration of Kansas' conservation laws.

Carlson Critical

Gov. Frank Carlson told the subcommittee of the House small-business committee that "excessive imports" of foreign oil "already have caused much injury to our state's economy." "Far greater injury is threatened," he declared.

Rep. Eugene J. Keogh of New York, chairman, and Rep. R. Walter Riehlman of New York heard the testimony. Rep. Ed Rees of Kansas sat in as an ex-officio member of the body.

Jeff A. Robertson, chairman of the Kansas Corporation Commission, described the "excessive importation of oil" as a "threat to the continued importance of the Kansas oil industry and to the very existence of the small businessman in whose hands it has heretofore prospered."

If excessive imports are permitted to continue, he said, "Kansas producers will not be able to maintain exploratory programs necessary to discovery and expansion of oil reserves. The small independent producer will be greatly injured, or destroyed."

If the independent producer is destroyed, he said, the independent refiner will be at the mercy of "large importers of oil," adding: "His existence will be short-lived."

Strict controls limiting imports were urged by virtually all of the witnesses who appeared. Many called for a flat limit of 5 per cent of total United States demand.

Morgan Speaks

T. A. Morgan, director of conservation, blamed imports with hampering efforts of his agency in determining proper allowables.

In Kansas, Morgan said, unnecessary waste is avoided by limiting production to prevent excessive above-ground stocks. During the past year, he pointed out, inventories steadily increased and state conservation agencies found it necessary to curtail production.

"If imports are unregulated, then the state agency is unable to anticipate the quantity of imports for even a week ahead, and, therefore, is confronted with an impossible task of determining proper levels for the state production."

Effective administration of the conservation laws, he said, "have been hampered for many months by unregulated and undeterminable imports."

"It is necessary," he concluded, "that imports be regulated so that the state conservation laws may be administered effectively."

Heber Beardmore, Jr., local chairman of the American Association of Oilwell Drilling Contractors, outlined the effect on drilling contractors of the recent cutbacks in production.

Kansas operators, he asserted, were lucky, since Kansas was not the first state to be "hit by the large oil imports."

However, he declared, when the state cut its allowable, "immediately the number of rigs in operation started to show a decline."

Up until a few weeks ago, he said, between 150 and 160 rigs were running in Kansas. By the middle of July, he continued, "we were down to 122 active rigs; 3 weeks ago we had 119 rigs in operation, and 2 weeks ago, the latest for which figures are available, we had only 114 in drilling service."

Refiners' Fears Aired

Fears of the small refiners were expressed before the committee by W. G. Tierney, vice president of Derby Oil Co., who foresaw a fatal threat to small refiners in the continuation of a high rate of imports.

"In our opinion," he said, "if the importation of foreign oil continues to increase, we are fearful that in the future we will be unable to secure enough crude oil to efficiently operate our refinery, as the independent producer will be forced out of business. This will necessitate our attempting to purchase necessary crude-oil requirements for our refinery from the majors."

The producers' viewpoint was given the committee by George H. Bruce, president of Aladdin Petroleum Corp., and Lloyd R. Pickrell, general manager of the T. C. Johnson Estate, both of whom expressed the belief that a strong domestic industry is invaluable to the nation and that it can only be attained through a limit on imports of foreign oil.

"If domestic production is retarded by continued excessive imports, we cannot find new reserves as we will not have the finances to do so," Pickrell declared. "Should another war develop in the future after this condition has existed for 2 or 3 years, I am doubtful if we could supply the petroleum necessary for our country's safety."

Pickrell urged adoption of the Thomas amendment to the Reciprocal Trade Agreements Act which would limit imports to 5 per cent of the domestic demand for petroleum.

Service Rigs Stacked

Steele S. Neely, of Shamrock Drilling Co., outlined the problems faced by well-servicing operators as a result of the Kansas production cutbacks.

Saying he had contacted 40 operators controlling about 200 well-servicing units, Neely told the subcommittee that he found 100 units now are stacked and that between 600 and 1,000 oil-field workers now are unemployed because of these idle units.

"The situation has become very serious and there is no question, in the minds of the oil fraternity, that the only solution to unemployment will be accomplished by the discontinuance of imports of foreign petroleum on the basis of which it is now received," he said.

Neely said the decline in operations, as much as 75 per cent with some operators, has been steady since last November.

"It looks as though nothing short of a miracle can save several hundred oil-field servicing units from bankruptcy if the continued purchase of foreign oil is allowed to filter into this country," he added.

Neely quoted Unemployment Compensation Department figures of the Kansas Labor Department showing that more than 25 per cent of all claims are paid to unemployed oil-field workers.

Governor Carlson in his statement said that in addition to the difficulties experienced by the oil industry, "the impact is being felt throughout our entire state economy. Injury to the Kansas oil industry is reflected in reduced purchasing power, loss to the state of important oil tax monies, and increased unemployment."

The Kansas governor spent considerable time criticizing witnesses at other hearings who made "assertions . . . indicating that conservation programs in oil-producing states are used in collusion to artificially control production."

"These assertions," he said, "are untrue."

Bill Providing for National Oil Policy Is Introduced in House

WASHINGTON.—A bill creating a national petroleum-policy council and providing for a national oil policy was introduced in Congress last week by Rep. Oren Harris of Arkansas, chairman of the House interstate commerce petroleum subcommittee.

The policy council would be composed initially of representatives of the Defense, State, Commerce and Interior departments and the National Resources Board. It would have the responsibility of regulating and maintaining policies with respect to supply and prices of petroleum.

Harris said the purpose of his bill is to insure that adequate supplies are available at reasonable prices in times of emergency and for expanded civilian needs. The legislation, he said, was drafted in the subcommittee as a result of long studies of the petroleum situation. It is planned to take it up for consideration next session.

Responsibilities Cited

The proposed council would have responsibility for providing, coordinating, unifying, clarifying, and recommending the formulation of petroleum policies affecting the government agencies, with respect to:

1. Development of the United States petroleum industry in order to meet, to the maximum practicable extent, emergency petroleum requirements;

2. Development of the petroleum industry in the Western Hemisphere to the extent necessary to meet Western Hemisphere economic and minimum emergency needs at all times;

3. Development of the petroleum, world-wide, to insure the availability of petroleum products to meet the national objectives of the United States;

4. Furtherance of conservation of United States petroleum resources through encouragement of practices to reduce waste and promote maximum ultimate recovery of oil;

5. Development of new sources of liquid fuels, including the sponsorship of the federal Government of research and development on processes for their production from gas, coal, oil shale, and tar sands;

6. Establishment of reserve stocks of petroleum products sufficient to meet requirements during a transition period from peace to an emergency;

7. Encouragement of exploration and development on public lands classified as potential sources of petroleum.

8. Encouragement of both public and private research in the improvement of fuel efficiency of petroleum-consuming equipment;

9. Encouragement of protection and dispersal of refining facilities in accordance with national security needs;

10. Encouragement of tanker capacity adequate for requirements;

11. Supplementation of domestic oil by importation of nondomestic crude oil to the extent consistent with the maintenance of a healthy domestic industry adequate for national needs; and

12. Development and maintenance of plans for the establishment of an emergency petroleum organization in the event of a national emergency.

Under the bill, all federal agencies having responsibilities with respect to petroleum would be required to carry out any recommendations made by the council, which also would recommend to Congress legislation to eliminate unnecessary duplication of effort or conflict of authority by government agencies.

The council machinery would be directed by an executive secretary, and it would be authorized to employ such experts, assistants, special agents and other employes as might be necessary. It also could call upon other agencies of the Government for such reports and information as they might be in position to furnish.

Provision is made in the bill for both industry and state participation in the formulation of programs through an industry advisory panel and a state-local advisory panel, the membership of which would be selected by the council. Questions of policy affecting the petroleum industry are to be referred to the industry advisory panel for recommendation, and those affecting the oil interests of the states and their political subdivisions are to be referred to the state-local panel.

Questionnaires Being Sent To Oil Companies by NPC

WASHINGTON.—More than 25,000 questionnaires designed to develop information on oil industry personnel have been mailed out by the special manpower committee of the National Petroleum Council, it was announced this week by committee chairman W. W. Vandeveer.

It is planned to send the questionnaire to every company in the industry. On separate sheets, each company will be asked to indicate the total number of personnel employed in exploration and production, manufacturing, pipe line transportation, supplies, shipping, and distribution, and general management, separated by sex, as well as the number of employes in the armed forces reserves or National Guard, the number of employes of draft age (under 35), and the number of men in positions which require long training or experience and for whom replacements are not readily available.

The request for the study originated with the National Security Resources Board which is responsible for coordinating military, industrial, and civilian mobilization planning for national security. The information developed will serve as a basis for planning the mobilization of the oil industry in the event of war.

Field Hearings on Gas Law Planned in Texas

AUSTIN.—Field-by-field hearings to obtain the information necessary under the state's new gas-measurement law are expected to be held by the Railroad Commission within the next few weeks.

Two meetings already have been held by the commission to discuss the new statute with those affected. Representatives of gas-transmission companies and major oil and gas companies were heard last week. The week before discussions were held with independent producers and landowners.

Primary question under consideration at both meetings was the method to be used by the commission in arriving at the temperature and pressure figures from which a "standard cubic foot of gas" will be calculated.

Under Texas' new law, a "standard cubic foot of gas" is defined as the volume of gas contained in 1 cu. ft. of space at 14.65 psia. and a temperature of 60° F. Whenever the conditions of pressure and temperature differ from this standard, conversion is to be made in accordance with the Ideal Gas Laws, corrected for deviation.

The Railroad Commission is empowered to "determine the average temperature of gas, as produced in each oil and gas field in Texas, and to determine the other variable factors necessary to calculate the metered volumes in accordance with the Ideal Gas Laws and the variable factors to correct for deviation from the Ideal Gas Laws."

In addition to the two meetings, the commission has sent Texas producers a questionnaire asking for information as to present measurement practices. The new law becomes effective October 5, so every effort is being made to have the engineering details settled by that date.

Texas, Louisiana Attack Seven Points in Federal Tidelands Bill

WASHINGTON. — Seven major points of difference between the two tidelands bills introduced in Congress last week by Rep. Francis E. Walter of Pennsylvania were the target of Texas and Louisiana officials testifying at a House judiciary subcommittee hearing on the legislation which opened August 24.

Through the hearings, the subcommittee hopes to reconcile these differences between the states and the federal Government and combine the two measures into one which will set forth the policy to be followed in the administration of the offshore oil resources.

The two bills were introduced by Walter after Sen. Joseph C. O'Mahoney of Wyoming, who had participated in some of the negotiations between the state and federal officials sponsored by House Speaker Sam Rayburn of Texas, declared he could sanction neither measure. Original plans called for O'Mahoney to introduce the bills in the Senate.

As the hearings opened it developed that while there are three vital differences between the bills drafted by the state officials and the Interior Department there are at least four others which will have to be fought out.

Definitely obnoxious to the states is a provision that at any time the federal Government could reserve all or any part of the tidelands for its own use in the interest of national security which was written into the bill prepared by the Interior Department.

Rights Would Be Void

This provision, state officials pointed out, would enable the Government to take the minerals out of the tidelands, depriving the states of any benefits from them and, allegedly, in effect nullifying the rights granted the states by the bill.

A second objection applies to a demand by the Government in its bill that the states pay it all moneys received from the tidelands since June 23, 1947, the date of the Supreme Court decision in the California case. Under this provision neither the states nor persons acting under state authority would be released from liabilities for operations conducted in the tidelands since that date, and no leases issued by the state since the decision was rendered would be recognized. In the case of Texas, the amount that would thus have to be accounted for would exceed $8,000,000, and practically all outstanding leases would be under a cloud.

The state officials are unalterably opposed, of course, to Government control and management of all tidelands from the shore out, including the marginal belt. Another objection is that the Great Lakes are not included in the definition of inland waters and quitclaimed to the states.

While the federal bill leaves blank the acreage which could be leased to any one person, state officials understand that Interior proposes that the maximum be 128,000 acres in wildcat territory and 30,000 acres in proven fields. They point out that there are some 90,000,000 acres of off-shore lands, approximately 500,000 acres off Texas alone, and contend that with such a limitation the states or federal Government would quickly run out of lessees, restricting free competition in lease bidding and materially reducing prices paid for leases.

The state bill contains no restrictions on the acreage that can be held by a single lessee, and officials say it should be left up to the states to fix any limits necessary. Both measures carry antimonopoly provisions which the state authorities claim are adequate to insure that all who wish will have an opportunity to develop the underwater resources.

The state officials dispute the equity of a provision in the government bill under which the states would not have the right to sue the federal Government to determine their claims to the tidelands, although the federal Government has the right to sue the states.

A final objection is aimed at a Government bill provision that lessees of the states will not be authorized to continue to pay rents and royalties to the states until the federal Government's claims to the tidelands have been determined by final court action.

Truman Says Mexican Loan Still Under Consideration

WASHINGTON.—President Truman said again last week that the resumption of negotiations for an oil loan to Mexico is still under consideration, but disclaimed any idea of when the talks will be reopened.

The oil loan was dropped some weeks ago when it was apparent that agreement could not be reached on a number of points, some of which reportedly did not involve petroleum directly.

The President's statement was not taken to mean that any definite steps toward resumption of the negotiations were contemplated in the immediate future but, rather, that the United States would be receptive to any new approach by the Mexican government.

House Winds up Study Of Acquired Lands Bill

WASHINGTON. — Hearings on legislation providing that all leases for oil and gas development on Government-acquired lands be subject to competitive bidding have been wound up by a House Public Lands subcommittee with indications that, if anything further is done with the measure this session, its application will be confined to Louisiana and Mississippi.

In those states, it was developed during the hearings, competitive leasing has an "historic basis," having been used by the Department of Agriculture before the handling of leases on these lands, comprising lands acquired for addition to the national forests, was turned over to the Interior Department 2 years ago.

At final hearings, the subcommittee was told that the Secretary of Agriculture, while preferring that competitive leasing be made mandatory with respect to all of the acquired lands, was willing to accept a limitation of the bill to the two southern states.

Members of the subcommittee raised the question of the constitutionality of a bill applying only to specified areas, but Rep. A. Leonard Allen of Louisiana, sponsor of one of the two bills dealing with the subject, contended that Congress has a right to deal as it sees fit with any element of Government property.

Subcommittee members appeared in agreement that any bill providing universal competitive leasing for acquired lands "in which a competitive interest" was shown would have little chance of enactment against the opposition of members from the public land states where there not only are considerable acreages of acquired lands but where also there is a fear that such a move would be only a first step toward eventual imposition of the policy with respect to the public domain.

Hallanan to Speak at New Orleans Meeting Sept. 22

Walter S. Hallanan, chairman of the National Petroleum Council and president of Plymouth Oil Co., will be the principal speaker at the annual convention of the Louisiana - Arkansas division, Mid-Continent Oil and Gas Association in New Orleans September 22-23.

His address will be given at the annual banquet on September 22 at the Roosevelt Hotel.

WASHINGTON WATCHING

BY BERTRAM F. LINZ

Things to Be Done

WASHINGTON. — Administration leaders are insisting that Congress remain in session until it has disposed of President Truman's "must" program, but the membership is becoming increasingly restive and may decide in the next few weeks that the world won't fall if the President doesn't get everything he wants this year, and just simply vote that the session is over and go home.

If Congress were to stay in Washington until all the bills in which the oil industry has an interest were enacted it would be here indefinitely. Just a casual glance down the list of pending measures shows a dozen or so in varying stages of progress.

Topping the list is the tidelands legislation, which it is very doubtful could be put through the committee hearings and floor debate.

Some of the other measures provide for the exemption of independent producers and gatherers from Federal Power Commission control, passed by the House and ready for Senate action; a prohibition against the acquisition by a corporation of the physical assets of a competing corporation where the effect may be to reduce competition substantially, also passed by the House, but not likely to receive Senate action this session; divorce of the various segments of the oil industry, dead for the session; extension of the Reciprocal Trade Act, passed by the House and due to be pressed in the Senate by the Administration; and labor relations, dead for the session.

Also there is the basing-point legislation, practically ready for the President's signature; elimination of premium payments by independent refiners purchasing Government royalty oil, also ready for approval; and competitive leasing of Government-acquired lands, highly unlikely of action this year.

Tax Turnabout

SENTIMENT for an easing of the tax load to stimulate business is gaining in Congress, but it is doubtful whether any definite action will be taken before next winter.

The move has the support of Chairman Walter F. George of the Senate finance committee, whose ideas carry a lot of weight with Congress. George has developed a definite program of tax relief which he believes will be a direct aid to industrial expansion and in the long run return more revenue to the Treasury than it would lose immediately through the changes.

To stimulate consumer buying, George proposes to repeal all of the wartime excise taxes on the ground that the levies on transportation, furs, luggage, jewelry, etc., are retarding buying and contributing to unemployment.

For the benefit of industry, the Senator proposes elimination of double taxation on corporate dividends, better provision for amortization of industrial plants and equipment, special deductions for long-term research, and preferential treatment for earned income.

When Congress opens its 1950 session next January pretty good information as to the financial prospects of the Government for the fiscal year will be available.

In any event, George and a lot of other members of Congress believe that the Treasury would benefit by taking the tax heat off and freeing funds for consumer spending and, equally important, investment in industry which since the war has had to keep profits high in order to get funds for necessary expansions, since risk capital has dwindled to a dribble.

A Tougher ECA

WITH possibilities already raised that Congress may lose interest in the Marshall Plan when asked for further funds next year unless western Europe makes for greater strides toward stability than it has thus far, Economic Cooperation Administration officials are giving signs of adopting a tougher attitude toward certain countries which appear to have been content to coast along on American aid rather than press their labor for greater productivity.

As a whole, Europe has accomplished a great deal since the Marshall Plan got under way 17 months ago, but the performance of the individual countries ranges from very good to very poor and those in the latter category are acting as a brake on the recovery of the others.

ECA's objective was to get Europe's productive machinery rolling; once started it was expected it would pick up speed from its own momentum. But it has been hard to get things moving in some countries, largely, apparently, because labor has not been interested enough to roll up its sleeves and pitch in.

Even if Hoffman and his European representatives have not been hammering the lesson home, Marshall Plan countries which undoubtedly have been following closely the course of the ECA appropriation bill in Congress must realize that sentiment toward ERP has been cooling and will get steadily icier unless it is demonstrated that the beneficiaries of the program are really paying in effort for the dollars they receive.

Laying the Foundation

AFTER many years of talking about it, Congress may finally be reaching the point where it is going to do something about enunciating a national oil policy.

The bill introduced by Rep. Oren Harris of Arkansas, at any rate, is a definite step toward that end, and the 12 objectives set forth by Harris might well have been written by an operating oil man. On the whole, the industry will find little to quarrel with in those objectives, and if there is anything it feels should be modified it will have ample opportunity to present its views next session.

It is significant that Harris has avoided some of the suggestions set forth in the past as desirable to safeguard our domestic resources, such as cutting back production 20 per cent and depending to that extent on imports, the development of great Government-owned or controlled reserves of locked-up oil and the like.

Harris has had long years of experience with the oil group of the House Interstate Commerce Committee. He has said frankly that the lack of a national policy has resulted in "confusion, controversy, bickering and indecision" which has not been healthy for the industry. Indecision on the part of Congress, he feels, has not only affected the domestic industry and kept continuously doubtful our ability to meet another emergency, but also has affected our foreign policy.

Although the legislation now is formally before Congress, it may be a long time before anything is enacted. Nothing further probably will be done until January, when the House committee may hold hearings on the bill. In contrast with the present prolonged session, next year's meeting of Congress may end early in July so that members will have ample time for campaigning. So if the Senate waits until the House has sent the bill over, it may not get much further than a Senate committee in 1950.

Engines to Burn Variety of Oil Fuels Needed, Sims Says

ALMA, Mich.—Both practical economics and technical improvements for diesel fuels, today and for the future, were discussed here last Friday at a regional meeting of the Western Petroleum Refiners Association.

Registration exceeded 100 diesel-fuel experts and interested refinery personnel. The sessions were held at Leonard Refineries, Inc., with Reid Brazell, president of that concern, serving as meeting chairman.

On the practical economics or "price" side this was said: "There is a distinct need for continued effort by refiners, diesel-engine manufacturers, and operators of equipment to work together in an effort to utilize engines which will burn the greatest variety of petroleum fuels. There is a rapidly growing sentiment not only from the operators of large power units but by the manufacturers themselves, that from an economic necessity the lower-priced fuels must be burned in stationary power plants. It seems logical that the refiner will be glad to supply these fuels to the user, and cooperate in research with the engine builder.

More Research Seen

"A popular demand for engines able to burn a greater variety of lower-priced fuels will undoubtedly encourage engine builders to carry on more research and development work along this line, developing engines which will enable the large diesel user to meet the increasing efficiency of high-pressure, high-temperature steam plants and placing them in a better fuel-purchasing position where any savings will ultimately be passed on to the consumer."

The speaker was J. Bryan Sims, superintendent, Board of Public Works, Grand Haven, Mich., with the subject of Sims' paper being "Operation of Low-Speed Heavy-Duty Diesel Engines Used in Public-Utility Services." Sims pointed out the importance of the diesel-oil price factor, particularly to the larger power producers.

An interesting point Sims made was: "The greatest objection by operators to the burning of the heavy fuels has been increased maintenance cost, but a recent study of a large plant operated by the author indicated that for a 5-year period the average cost per kilowatt hour generated for maintenance was $0.00055 while the average cost per kilowatt hour generated for fuel was $0.00489."

The subject of quality requirements for diesel fuels was treated by an expert representing a large diesel operator, in fact possibly the largest—the U. S. Navy, which employed about 60 million diesel horsepower during World War II. Lt. Comdr. O. H. Landua, Bureau of Ships, Navy Department, Washington, said that before the mid-1920's one main point which sold diesel engines was the claim that they could burn almost anything from coal dust to coal tar (large cylinders, great weight, slow speeds, and air injection). Later, however, fuel insensitivity soon gave way to other operational advantages (higher speeds, smaller sizes, solid injection). Commander Landua gave an interesting chronological account of the development of the Navy's diesel-fuel specifications into the present 7-0-2 designation.

Landua closed by saying: "The increased competition for the diesel-fuel fraction has heightened our interest in new sources of supply. During late war years, conversion of surplus natural gas to 90-cetane diesel fuel was considered. This could have increased the supply of 50-cetane fuel by 25 per cent by using the high-cetane fuel to blend with low-cetane stocks. We are currently very interested and engaged in work to determine the suitability of synthetics for Naval use. This of course would be one way to increase supply sources."

Fuel Program Outlined

In the search for technical improvements, C. C. Ward, senior chemical engineer, U. S. Bureau of Mines, Bartlesville, outlined some of the objectives and present work of the bureau's diesel-fuel program.

In regard to combustion studies on pure hydrocarbons, Ward said data were virtually nonexistent. Certain types of fuels are known to be satisfactory for diesel use, while others are not, few fundamental studies relating fuel composition and combustion characteristics having been made. Today there are plentiful stocks of oil available, but the refiner is supplying diesel fuels that are blends of straightrun and cat-cracked stocks—and it is realized by all that in case of emergency the percentages of cracked stocks will be increased. It was the realization of this outlook that caused W.P.R.A. to join the bureau in working out a cooperative research program.

Ward discussed the bureau-W.P.R.A. studies on straightrun fuels, analyses of selected Navy fuels, and the Coordinating Research Council sponsorship of combustion studies in a new constant-volume combustion bomb.

The new bomb method has ease of control and accuracy for studying fuel sensitivity in terms of temperature, pressure, and time. Another advantage is its low fuel requirement (1 to 10 ml.). The electrically heated bomb is 6 by 2½ by 3¼ in., with ports for air charging and air purging. An opening for the fuel injector is at one end and an opening for the pressure sensing elements at the other. An electronic pickup indicates the opening and closing of the injector nozzle. The indicating oscilloscope trace is photographed to give a permanent record. Microtesting of diesel fuels and hydrocarbons will be carried on, since ignition delay as determined by the bomb appears to be proportional to cetane number. The bureau also will concentrate research on the development of separation and analytical methods of fuels.

C.I.O. Launches Attack to Remove Denham From NLRB

WASHINGTON.—The Congress of Industrial Organizations launched an all out attack last week designed to pry Robert N. Denham loose from his job as general counsel for the National Labor Relations Board.

A telegram to President Truman from the executive council of the C.I.O. Oil Workers International Union asked that Denham be removed from office on the ground he had made a "scandalous" deal with major oil companies.

Specifically, the union charged that Denham used "dictatorial powers at the request of major oil companies" in denying "fair" hearings before the NLRB to 253 oil workers discharged in California. The union alleged the "deal" to stop the hearings was consummated in Washington, and named two men, one an alleged lobbyist and the other a former associate of Denham's.

Prints of O. I. I. C. Movie Are Now Being Distributed

Prints of Oil Industry Information Committee's motion picture, "The Last Ten Feet," are being distributed to district O.I.I.C. offices and to oil companies and associations which purchased them for their own libraries.

Special showings of the movie will be one of the features of Oil Progress Week, October 16-22.

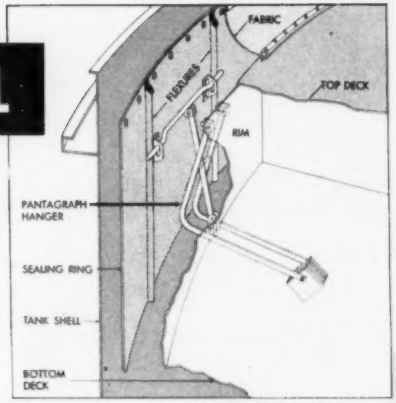
The film tells the story of the oil industry and its contributions to the progress and comfort of man. It is narrated by Andre Baruch. It points out the social and economic significance of oil and shows some of the feats that are performed daily by the nation's oil men in transforming the oil into many petroleum products.

The Improved HORTON SEAL

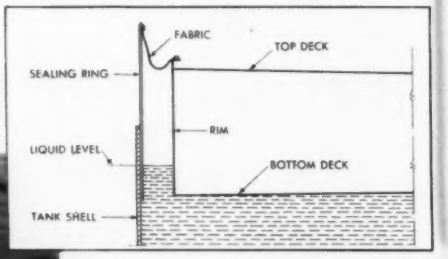
keeps evaporation losses low when HORTON Floating Roofs are at high liquid levels

With the improved Horton seal, you can utilize more of your tank capacity and still have protection from evaporation losses. As the view below shows, tanks with Horton Floating Roofs can be filled until the sealing ring extends above the tank shell. Supplemental "gadgets" to improve roof efficiency at the top of the tank are not necessary and the tank shell need not be extended to gain more usable tank capacity. Furthermore, the sealing ring retains its vertical position, even when it extends above the tank shell, and the entire assembly of seal and roof will go back down into the tank safely and easily as the liquid level is lowered.

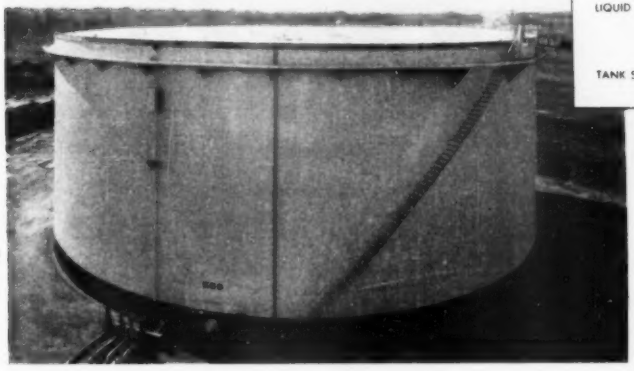
With improved seal construction, the Horton Floating Roof adds even greater protection against evaporation losses and fire hazards. Designed to float directly on the product stored, the Floating Roof may be installed in new or existing flat-bottom tanks. It is most efficient for tanks that are filled and emptied more than five or six times per year, tanks in blending service and tanks storing corrosive products. For complete details, ask our nearest office for a copy of Bulletin B.



When the Floating Roof is below the top of the tank, the Horton seal functions as shown in the diagram above to prevent the escape of vapors. The fabric closes the space between the top deck and sealing ring, and the sealing ring is held snugly against the tank shell. As the liquid level nears the top of the tank, a part of the sealing ring extends above the tank but the pantagraph hangers inside the seal still hold the sealing ring vertically, with the lower portion in contact with the shell. Thus, the effectiveness of the seal is maintained even though part of the sealing ring is above the tank top.



The diagram above shows that the liquid level can be near the top of the tank and the improved Horton seal will still give protection. Even if the liquid should accidently overflow, the Horton seal will not be damaged, and will be safely lowered inside the tank shell as the liquid level recedes.



The view at the left shows a tank with a Horton Double-Deck Floating Roof filled so that the top of the sealing ring extends above the top of the tank shell.

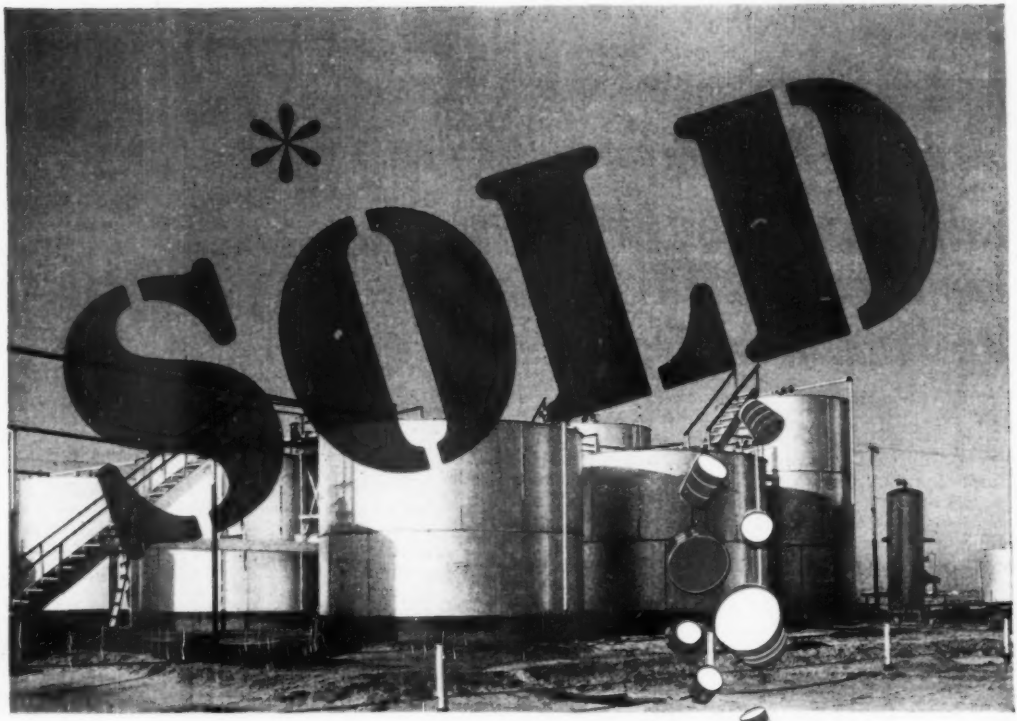
CHICAGO BRIDGE & IRON COMPANY

Plants in BIRMINGHAM, CHICAGO, SALT LAKE CITY and GREENVILLE, PENNSYLVANIA

Atlanta, 3.....2154 Healey Bldg.
Birmingham, 1.....1536 North 50th St.
Boston, 10.....1025—201 Devonshire St.
Chicago, 4.....2128 McCormick Bldg.
Cleveland, 15.....2204 Guildhall Bldg.
Detroit, 26.....1514 Lafayette Bldg.
Havana.....402 Abreu Bldg.
Houston, 2.....2119 National Standard Bldg.
Los Angeles, 14.....1523 General Petroleum Bldg.
New York, 6.....3347—165 Broadway Bldg.
Philadelphia, 3...1615—1700 Walnut Street Bldg.
Salt Lake City, 1..1525 First Security Bank Bldg.
San Francisco, 11..1254—22 Battery Street Bldg.
Seattle, 1.....1325 Henry Bldg.
Tulsa, 3.....1606 Hunt Bldg.

REPRESENTATIVES AND LICENSEES

Horton Steel Works, Limited, Fort Erie, Ontario, Canada
Ateliers et Chantiers de la Seine Maritime, Paris, France
Constructions Metalliques de Provence, Arles-sur-Rhone, France
Chicago Bridge & Iron Company, Ltd., Apartado 1348, Caracas, Venezuela
Compagnia Tecnica Industrie Petroli, S.A.I., Rome, Italy
Whessoe, Limited, Darlington, England
Motherwell Bridge & Engineering Company, Limited, Motherwell, Scotland



EVERY TANK . . . EVERY TIME WITH *Visco*

THE CONSISTENTLY EFFICIENT EMULSION BREAKER

VISCO PRODUCTS COMPANY
INCORPORATED
City National Bank Building
Houston 1, Texas

Call Houston, CAPITOL 7300, collect, for fast action on your emulsion-breaking problems.

Visco

DEHYDRATING AND DESALTING CHEMICALS · WHEREVER COST AND EFFICIENCY COUNT

NOTICE: Visco Products Company is authorized to manufacture and sell Visco Oil Treating compounds for use in the breaking and resolving of oil emulsions and to grant licenses for such use under the following United States patents: 1,880,562, 1,900,040, 1,912,330, 1,927,350, 2,000,600, 2,000,040, 2,001,600, 2,214,760, 2,214,784, 2,228,109, 2,268,614, 2,287,010, 2,318,004, 2,318,005, 2,321,000, 2,350,554 Re. 20,737 and patents pending. Any purchaser of Visco Oil Treating compounds is authorized to use the same in the treating, breaking and resolving of oil emulsions in accordance with the above patents. The royalty for such use is included in the purchase price. Visco Products Company is authorized to and is willing to grant licenses on a royalty basis, to all companies, and to others desiring to practice the patented subject matter, under any and all of the above patents, permitting the user to purchase the oil treating compounds at will from any vendor, and to prepare the compounds for use under the above patents or patents at a royalty charge of 20 cents per gallon. Application for license should be made to Visco Products Company, Houston, Texas.

International

WORLD-WIDE OIL DEVELOPMENTS

AGIP Adds Two Producers in Po Valley, Asks State Monopoly

AZIENDA GENERALE ITALIANA PETROLI, the Italian government oil agency, is reported to have completed two more wells testing 100 and 80 bbl. daily in its new Cortemaggiore field of the Upper Po Valley.

Development of Cortemaggiore by the state organization is proceeding in the midst of a political controversy over proposed amendments to the Italian mining law which would open up the country to private capital, including that of such major international companies as Standard Oil Co. (N. J.).

The Cortemaggiore discovery has been used to bolster AGIP's case for a state monopoly. Cortemaggiore appears to be a good gas field. The No. 2 well showed some light oil. No. 3 was taken to 1,585 m. (5,200 ft.), and No. 4, to 1,787 m. (5,850 ft.). These two new completions were said to indicate that the center of the field lies eastward toward Cremona.

State Control at Issue

It has been announced that the Italian Government will make a definite statement on the oil situation by the end of September.

There appears to be considerable sentiment for state control of the exploration and production effort in the country. Reports that the U. S. State Department recently told the Italian Government of its desire to see American companies supported in their Italian programs were seized on in Italy by leftist political forces contending against "foreign intervention" in the Italian affairs.

The government's Interministerial Reconstruction Committee recently decided in favor of state participation to some degree in the oil and gas exploration and production companies. The council adopted the view of the Italian finance minister who has urged state participation, though excluding complete nationalization.

The action of the council was a development unfavorable to those who have been advocating that private capital be allowed for the oil and gas industry. Earlier these groups pointed out that AGIP's program would still fail to give an all-Italian state-owned industry, since the government agency, in order to obtain financing, had sold to Anglo-Iranian Oil Co., Ltd., 50 per cent of its Venice refinery.

Refining Not Involved

Expansion of the Italian refining industry appears to be unaffected by the controversy over exploration and production. Like the situation in other European countries, the Italian refining industry awaits a decision on the amount of aid to be provided by the Economic Cooperation Administration.

Stanic, the new refining company jointly owned by Jersey Standard and the Italian company, ANIC, has taken the initial steps in its plans to modernize the former hydrogenation plants at Bari and Leghorn.

Stockholders of Stanic met in Milan and voted to increase the initial capital to 12,000,000,000 lira ($21,000,000). The board of directors met under the presidency of Dr. Ernesto Santoro and nominated as managing directors Victor J. Decorte for the American group and Dr. Santoro for the Italian interests.

Creole Output Averaging About 600,000 Bbl. Daily

Though Creole Petroleum Corp.'s first half net production of 543,507 bbl. daily was about 14 per cent below the same period of 1948, present output has climbed back up to about 600,000 bbl. daily.

In a stockholders' report, A. T. Proudfit, Creole president, pointed out that conditions appear to be improving and that the price of heavy fuel oil in the United States is showing signs of strengthening. Last winter's drop in fuel oil prices at the gulf from $2.46 in November 1948 to a low of $1.15 in May 1949 was a major factor in reducing the company's first half income from $100,020,000 in 1948 to $51,500,000 in 1949.

Kirkuk-Tripoli 16-in. Line Begins Operation

THE new 16-in. Kirkuk-Tripoli pipe line of Iraq Petroleum Co., Ltd., has gone into limited initial operation. It is reported to be delivering about 40,000 bbl. daily.

The line parallels the existing 12-in system which extends from the producing area in Iraq to Haditha, on the Euphrates River, then divides with one branch running through Syria to Tripoli and the other to Haifa in Israel.

Improvised slush-pump equipment is being used on the line pending completion of the new stations. By the end of the year, the 16-in. line is expected to be delivering about 90,000 bbl. daily in addition to the 40,000-45,000 bbl. daily handled through the 12-in. The new 16-in. line as well as the 12-in. was designed by H. S. Austin, New York consulting engineer to I.P.C., who died suddenly near Easton, Pa., July 5.

I.P.C. had completed the other leg of the 16-in. nearly to Haifa when the Palestine-Arab war broke out. The Iraq Government has refused to allow production from the country to enter Israel, and this caused a shutdown in April 1948 of the Haifa refinery, an 83,000-bbl. daily plant and an important supplier of products to Europe.

Opening of additional capacity to the Mediterranean through the new 16-in. to Tripoli is of particular importance to the French Cie Francaise de Petroles whose interest in I.P.C. represents their only holdings in Middle East oil. I.P.C.'s production, limited to pipe-line capacity, has been held down to 50,000-55,000 bbl. daily for more than a year with the Palestine branch closed.

For the first 150 miles from Kirkuk to Haditha, the new 16-in. uses the line originally laid for the Haifa terminus. Here it is tied into the pipe which has been laid over to last year to Tripoli.

World Production Off 92,600 Bbl. Daily in June; Upturn Seen

by Dahl M. Duff

THE trend of crude-oil production throughout the world in June was generally downward. The largest reductions from the previous month were in the three major producing countries in the Middle East.

All available reports indicate that world production in June approximated a daily average of 9,090,300 bbl. This is 92,600 bbl. daily less than production in May. Of the over-all decline, 39,000 bbl. daily was in the United States where June production was 4,933,000 bbl. daily against 4,972,000 bbl. daily in May.

The foreign total includes the output of Russia and such Russian-controlled areas as Romania. Current Soviet production is believed to be about 738,000 bbl. daily, though no authenic information is made available.

The remaining foreign production in June averaged 3,419,000 bbl. daily. This represents a decline of slightly more than 1 per cent from the revised May total of 3,472,800 bbl. daily.

Venezuelan production, which fell off sharply last March and has since recovered part of the drop, showed virtually no change from May to June. Weekly industry reports give an output of 1,290,100 bbl. daily for Venezuela in June against 1,292,000 bbl. daily in May.

Mexican Output Down

For the Western Hemisphere as a whole, excluding the United States, production was off about 14,000 bbl. daily to an average of 1,754,400 bbl. daily. Reports indicate Mexico's output dropped back more than 8,000 bbl. daily from the year's high level of 165,700 bbl. daily officially reported for May. Production in Colombia also declined from the year's record of 89,400 bbl. daily in May. June output was 85,560 bbl. daily, including 31,626 bbl. of crude and 2,186 bbl. of condensate from De Mares, 26,645 bbl. from Barco, and 19,594 bbl. from Yondo.

In Canada production continued at its relatively stabilized rate with a June output of about 56,000 bbl. daily. The effect of proration in Alberta is shown by the reported production of 57,300 bbl. daily for the week ended August 13. Alberta's production accounts for all but about 4,500 bbl. daily of the Canadian total.

There were several small but significant gains in production in Europe. German production pushed up to another high in June with a daily average of 16,500 bbl. daily. Preliminary figures for July indicate the June record was exceeded by almost 1,000 bbl. daily. In the Netherlands, production from Schoonebeek field rose from 11,300 to 11,800 bbl. daily. Italy's output continued at a reported 200 bbl. daily, but this will move upward later when the new Cortemaggiore field comes into commercial production.

Middle East Lower

Crude production in the Middle East was down about 3 per cent from May to June as a result of slackening demand in Europe and Asia, decreased United States imports, and dollar shortages in many foreign areas. A decline of about 5 per cent in Middle East output was reported from April to May.

The June drop of nearly 42,000 bbl. daily brought the total for the area to 1,375,700 bbl. daily. Iranian production was down 17,500 bbl. daily to 549,300 bbl. daily; Kuwait, 18,600 bbl. daily to 239,500 bbl. daily, and Saudi Arabia, 21,100 bbl. to 481,100 bbl. daily. Iraq's production rose from 60,300 bbl. daily in May to 75,900 bbl. daily and is scheduled to go much higher in coming months with the opening of the 16-in. line to Tripoli. Of the Iraq total, 68,400 bbl. daily was accounted for by Iraq Petroleum Co., Ltd.

A lack of accurate information continued to cloud the oil-production situation in the Far East. The new field in western New Guinea is now running about 6,000 bbl. daily, and elsewhere in Indonesia, production is reported to be climbing back toward its prewar level, despite political turmoil in the area.

CRUDE-OIL PRODUCTION
(Thousands of barrels daily)

Country	June 1949	Previous month
Western Hemisphere:		
Argentina	60.0	62.0
Bolivia	1.9	1.9
Brazil	0.2	0.2
Canada	56.0	53.7
Colombia	85.6	89.4
Cuba	0.2	0.2
Ecuador	7.1	7.0
Mexico	157.0	165.7
Peru	40.0	40.1
Trinidad	56.3	56.3
Venezuela	1,290.1	1,292.0
Total	1,754.4	1,768.5
Europe and Africa:		
France	1.1	1.1
French Morocco	0.4	0.4
Germany	16.5	14.7
Italy	0.2	0.2
Netherlands	11.8	11.3
Egypt	43.7	45.0
United Kingdom	1.0	0.9
Total	74.7	73.6
Middle East:		
Bahrein	29.9	30.2
Iran	549.3	566.8
Iraq	75.9	60.3
Kuwait	239.5	258.1
Saudi Arabia	481.1	502.2
Total	1,375.7	1,417.6
Far East:		
British Borneo	70.0	70.0
Burma	0.5	0.5
China	1.8	1.8
India	5.3	5.3
Indonesia	125.0	125.0
Japan	3.8	3.8
New Guinea	5.9	5.0
Pakistan	1.9	1.9
Total	214.2	213.1
Total, foreign less Russia and E. Europe	3,419.0	3,472.8
Russia and E. Europe:		
Albania	1.0	1.0
Austria	17.7	17.5
Czechoslovakia	0.9	0.9
Hungary	10.0	10.0
Poland	2.6	2.6
Romania	80.0	80.0
Russia	625.0	625.0
Yugoslavia	1.1	1.1
Total	738.3	738.1
Total foreign	4,157.3	4,210.9
United States	4,933.0	4,972.0
World total	9,090.3	9,182.9

Figures are authoritative for all countries in the Middle East and most of the more important producing countries in the Western Hemisphere and Europe. In those cases where June production or a reliable estimate was not available, the daily average for the previous month has been carried forward. Figures in the column "previous month," do not agree in some instances with those heretofore published for May since revisions have been made on the basis of subsequent information. Data for Colombia and Canada include condensate. No up-to-date figures are available for Russia and the Russian-dominated countries of eastern Europe, and here the data are the latest obtainable. Other information in this tabulation is from official government or company reports and reliable private sources.

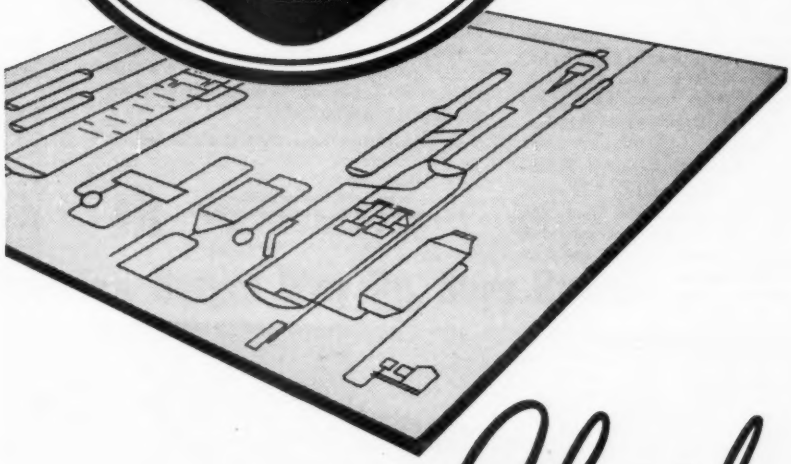
New Refinery to Produce Sweden's First L.P.G.

Koppartrans Oil Co., which recently completed a new refinery at Goteborg, Sweden, has announced plans for Sweden's first production of L.P.G. at the plant.

The refinery has a capacity of about 12,500 bbl. daily. The L.P.G. produced from the refinery gases is expected to find a ready market in Swedish homes and industry.

FARM CO-OP BUREAU

INDIANA FARM BUREAU CO-OP



GOES *Fluid*

The Mount Vernon, Indiana, refinery of the Indiana Farm Bureau Cooperative Association, Inc., marks the location of the next UOP Improved Fluid Catalytic Cracking Unit. Franklin Supply Company will handle procurement of materials for this new unit, which will be designed for a nominal capacity of 4,000 barrels. Operated in conjunction with an existing UOP thermal cracker, the unit will result in improved quality and substantially increased production of gasoline. Again...the UOP Improved Fluid Catalytic Cracking Unit is specified for reasons of quality and quantity of yield combined with economy and flexibility of operation.

UNIVERSAL OIL PRODUCTS COMPANY

UOP General Offices: 310 S. MICHIGAN AVE., CHICAGO 4, ILLINOIS, U. S. A.
LABORATORIES: RIVERSIDE, ILLINOIS

Universal Service Protects Your Refinery

You don't lead in sales for 17 years unless you lead in value!

International Trucks have led in heavy-duty truck sales for 17 straight years!

WHAT HEAVY-DUTY TRUCKS offer the biggest value? The most exacting truck buyers in America have answered that one.

You can find their answer by looking at registration figures for new trucks with gross weight ratings of 16,001 pounds or over.

Those figures show that International Trucks have been *America's largest-selling heavy-duty trucks for 17 straight years!*

A heavy-duty truck is a major investment. You can bet your bottom dollar that the men who buy them don't give any line of trucks a vote of confidence like they've given International unless their profit and loss statements show them that it pays.

But don't think that International Trucks offer outstanding value in the heavy-duty field *alone*. There are 22 models of International Trucks plus 1000 specialized variations to meet individual hauling requirements. Gross weight ratings range from 4,400 to 90,000 pounds.

Trucks built to meet your specifications—No matter what model International Truck you buy, you get the basic values that have made International Trucks the largest-selling heavy-duty trucks in America for the past 17 years.

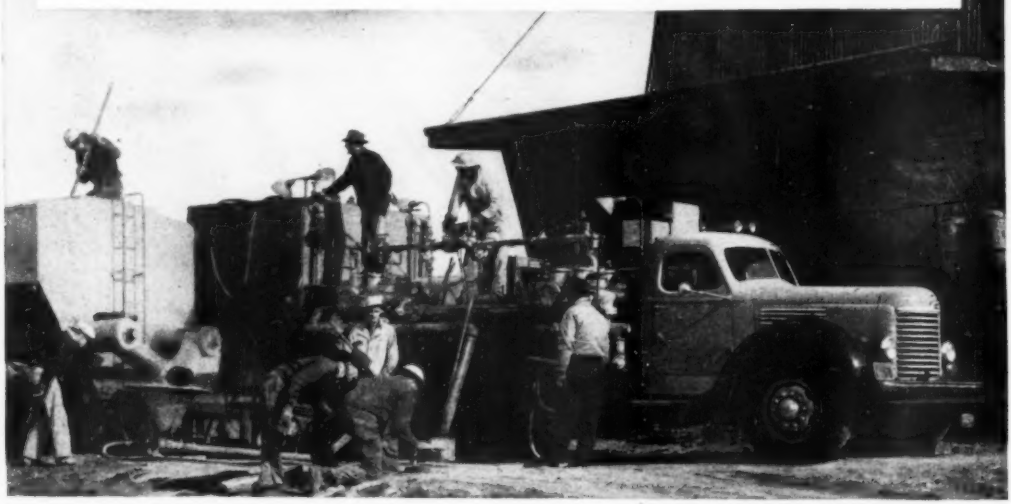
You get a rugged truck unweakened by a single compromise with passenger car design.

You get a long-lasting truck. *More than half of all the Internationals built in the last 42 years are still on the job.*

You get a truck specialized to meet your particular specifications; specified by a truck sales engineer who knows your business in terms of the demands it makes on trucks.

See your International Truck dealer or branch.

International Harvester Builds
McCormick Farm Equipment and Farmall Tractors
Motor Trucks and Industrial Power
Refrigerators and Freezers



INTERNATIONAL TRUCKS

INTERNATIONAL HARVESTER COMPANY • CHICAGO

FIRST IN HEAVY-DUTY TRUCK SALES FOR 17 STRAIGHT YEARS

Equipment to Begin Oil Search In Southern Mexico Is Readied

A SHIPLOAD of equipment is scheduled to leave Houston late in August for southern Mexico to begin the exploration program of Mexican-American Independent Oil Co.

The work has been placed in charge of Bart W. Gillespie as general manager. Gillespie formerly handled much of the exploration program carried out the last 3 years on the naval petroleum reserve in Alaska. With Gillespie is J. R. Coleman, who formerly was chief engineer in charge of drilling in Alaska.

Mexican American Independent (CIMA) is reported preparing to drill two wells initially. Kerr-McGee Oil Industries, Inc., Oklahoma City, has contracted to do the drilling.

One of the two initial wells will be in Campeche near Rio del Carmen. The second will be in Vera Cruz near Coatzacoalcos, a directional hole to test a structure a short distance offshore in the Gulf of Mexico. It is expected the wells will be taken to about 6,000 ft.

Kerr-McGee, which will operate in Mexico as Kermac, Inc., with George Kitchell supervising operations, also is reported to have contracted with American Independent Oil Co. to drill in the company's concession in the neutral zone between Saudi Arabia and Kuwait.

American Independent, organized in 1947 by 10 companies and individuals with Phillips Petroleum Co. holding a 29.7 per cent stock interest, is headed by Ralph K. Davies. It was one of the original partners in the Mexican contract, and as a result of its recent purchase of part of the interest of E. W. Pauley, now holds 53⅓ per cent of CIMA. Pauley now holds 13⅓ per cent and Signal Oil & Gas Co. de Mexico the remaining 33⅓.

In the neutral zone in the Middle East, American Independent has an undivided half interest with the other half held by Pacific Western Oil Corp. In July, the two companies announced they had reached an operating agreement under which American Independent would complete exploration work already begun and carry out a drilling program for the joint interest of both concessionaires.

Russian Output Way Up, Says Russia

WASHINGTON.—Russian crude-oil production now is slightly more than double that of 1945, it was disclosed last week by the Russian Embassy in Washington.

Compared with 1945, production increased 12 per cent in 1946, another 21 per cent the following year, 18 per cent further in 1948, and currently is running 12 per cent above last year, it was shown in the quarterly report of the central statistical administration of the Council of Ministers, released through the embassy.

Production of kerosine also was 12 per cent ahead of last year during the second quarter of 1949, that of benzine was up 11 per cent, and synthetic rubber showed an increase of 35 per cent. In no instance, however, were basic figures revealed from which any estimates of volume of output might be made.

During the second quarter, the oil industry exceeded the requirements of its program for the period by 4 per cent, the report stated. Only 3 of 22 industries reported upon failed to meet their quotas.

The report noted that the drilling of oil wells has been speeded up, but did not say by what means. In other reports through the embassy, however, it was stated that Soviet oil workers last year and so far this year offered more than 30,000 "rationalization" proposals and inventions, of which 22,000 "have found broad application in the oil industry."

"These inventions and rationalization proposals have caused a significant increase in oil production, in the mechanization of work, and in saving money in construction work in the oil fields," it was declared. "The total saving to the Soviet Government as a result of these proposals amounts to approximately 170,000,000 rubles."

Approximately 12,000,000 rubles were expended in developing and testing the proposals, the report said, and another 7,000,000 rubles were distributed to the workers making suggestions and 2,000,000 rubles as bonuses to managers and workers who actively assisted in their development.

Bahrein Building New Crude-Distillation Unit

Bahrein Petroleum Co., Ltd., has started construction of a 55,000-bbl. crude-distillation unit at its refinery on Bahrein Island of the Persian Gulf.

The company is now completing a vacuum unit at the refinery and has other miscellaneous refinery work under way to be completed next year, along with the crude distillation unit. The construction work is being done by International Bechtel, Inc. The Bahrein refinery at present has a capacity in excess of 100,000 bbl. daily.

New Firm to Construct Refinery in Puerto Rico

NEW YORK.—Plans have reached the engineering stage on a proposed 25,000-bbl. Puerto Rican refinery to process foreign crudes and market products on the United States East Coast.

Lyford and Eberle, New York consultants representing undisclosed principals, report the refinery will be located on the south coast near Ponce. It will initially process Venezuelan crudes. Other foreign crudes may also be charged.

The plant will produce gasoline, kerosine, and light and heavy fuel oils. A catalytic cracking unit may be included in the original refinery, or may be incorporated at a later date. The company, now undergoing incorporation in Puerto Rico, will be known as Puerto Rican Oil Refining Co., Inc., and will probably be headed by Frederic E. Lyford, formerly president of Merritt-Chapman & Scott Corp.

The project wil cost an estimated $20,000,000. Engineering work contracted by Parsons, Brinckerhoff, Hall & MacDonald of New York may be concluded in early October when the company will consider contracts. Little marketing is anticipated for local consumption, as the company plans to close long-term contracts for delivery at the refinery to distributors who will serve eastern gasoline and fuel markets.

The advantageous tax situation on the island is believed the primary reason for locating in Puerto Rico.

Turkey's Only Field Now Producing 2,100 Bbl. Daily

The government-operated field at Raman Dag in southeastern Turkey is now producing 300 tons (about 2,100 bbl.) daily, according to the Turkish Information Service in New York.

Work in the area continues in a developmental stage, and production may soon be stepped up to between 700 and 1,000 tons daily, according to the agency. Raman Dag is the only producing field in Turkey, though several other areas are being explored.

Syrian Revolt May Not Delay Tapline Progress

LAST week's overthrow of the Syrian Government brought up the question of ratification of Trans-Arabian Pipe Line Co.'s right-of-way agreement, but there was a feeling that the new regime will not cause any serious interference with the company's program.

Trans-Arabian obtained transit rights from Syria with cabinet approval after Marshal Zayim took over the country last March. In the latest coup d'etat, Zayim and his premier were executed, and a new government installed.

Hasem Bey Atassi, head of the new Syrian government, said in Damascus, that actions of the Zayim group such as the pipe-line convention will neither be confirmed or denied and that the decision will rest with the parliament to be convened later.

Also affected by the situation is the agreement signed with Syria a few months ago by Middle East Pipe Lines, Ltd., whose Iran-Mediterranean line is still in the planning stage. Both agreements granted important concessions to Syria in the matter of oil sales, refinery processing, and other respects.

Trans-Arabian's program to begin construction from the Mediterranean end of the line already is in motion, and additional cargoes of equipment are scheduled to arrive in Beruit, Lebanon, late in August and in early September. The 30-31-in. pipe line passes through Lebanon, Syria, and Trans-Jordan before reaching Saudi Arabia.

Feldspar Mines Used for Oil Storage in Sweden

The Swedish Government is using two abandoned feldspar mines for the storage of oil, according to reports from Stockholm. The oil settles over a level of salt water, and heating coils have been installed for use during the winter.

Capacity of the two mines is about 14 tanker cargoes — about 1,900,000 bbl. The government also is investigating the possibility of using other abandoned bomb-proof mines for storing strategically important liquid fuels.

I.P.C. Finishing 6,000-Bbl. Topping Unit at Tripoli

Iraq Petroleum Co., Ltd., will complete the construction of an atmospheric topping unit at its Tripoli, Lebanon, refinery in late September or early October.

The unit will have a capacity of 6,000 bbl. daily. The plant at present has a capacity of 5,000 bbl. daily. The company is also adding facilities for the doctor sweetening of gasoline and kerosine and a new ethylation unit has been completed. Two new B. & W. boilers have been installed and also an electric unit.

The plant is located near the Tripoli teminal of the pipe line which extends from Kirkuk field in northern Iraq.

Good Well Completed in Germany's Hanover Area

A NEW oil discovery has been made by Gewerkschaft Brigitta in the Hanover area of central Germany about 6 km. northeast of Steimbke field.

The well, 1 Suderbruch, found production in the Cornbrasch between 2,060 and 2,074 m. (about 6,800 ft.). It flowed 34.5° A.P.I. gravity oil at a rate of between 30 and 40 cu. m. (about 190 to 250 bbl.) daily.

The discovery appeared to rank along with the recent Ruehlertwist well in the Emsland area as the major results of significance thus far in the exploration program being carried out in postwar Germany.

The Brigitta company is owned equally by Shell and Standard Oil Co. (N. J.). The land on which the Suderbruch well is located is held by Brigitta and Vacuum Oil Co. on a 50-50 basis.

The Suderbruch discovery was on a interdomal structure between the Lichtenhorst and the Eilte salt domes. The structure appeared to be a low fold. Geology of the area is extremely complex on account of faulting, and some producers in the past have had high initial production from small isolated accumulations.

The Suderbruch well has been over a year in drilling. The gravity of the oil found is considerably higher than the 19° crude produced at Steimbke.

International

Shell Petrochemical Plant Placed in Operation

Shell Petroleum Co., Ltd., has placed in operation its new petrochemical plant at Stanlow in Cheshire on the Manchester Ship Canal in Great Britain.

Built at a cost of approximately $16,000,000, the facilities will enable the British to realize a dollar saving of some $5,000,000 a year in the replacement of imports from the United States of various chemical solvents.

The oil which will be fed to the plant's cracking units will originate in the sterling production zone, and some of the production from Stanlow will be exported. Initial production of the new Stanlow plant was reported at 24,000 tons a year. At Stanlow, Shell operates a refinery of 16,700 bbl. daily capacity using topped crude and distillates and also produces synthetic soaps and wetting agents.

Next Week

Unitization and pressure maintenance at Longville, Louisiana, field.—W. L. Horner, chief engineer, Barnsdall Oil Co., describes procedures employed in unitizing, and the remarkable results subsequently obtained in repressuring by water injection. Initially, 976,000 bbl. oil were produced with a reservoir pressure drop of 885 psi. However, following 6 months' water injection, the decline not only was arrested but substantially reversed.

New doctor solution regeneration unit.—General Petroleum Corp. puts in new installation at its Torrance, Calif., refinery. District editor Robert Harwick describes processing design and operational features.

Pumping with electricity.—W. D. Noel, Odessa, Tex., discusses equipment used and results obtained in McCamey and other fields.

Ground plastic.—Permian basin operators are finding this new material useful in combating lost circulation in drilling wells.

Combination pressure-maintenance and gas-lift plant.—Sinclair Oil & Gas Co. in Lost Soldier field, Wyoming, operates a 14-unit compressor station which has had an impressive performance history. District editor Roy F. Carlson describes equipment arrangement, results obtained.

New vacuum unit.—Picture story of construction work at Paulsboro, N. J., refinery of Socony-Vacuum Oil Co., Inc.

Need Orifice Plates?

We've got the *FINEST*

We manufacture and have in stock, both handle type orifice plates and plates for orifice fittings. Our plates are made from the finest materials obtainable and are manufactured and machined to AGA recommendations.

We sell all kinds and all types of instruments for oil production, refining and gasoline plants. Whatever your instrument needs are, we can supply them to your complete satisfaction.

Prices shown on Orifice Plates Subject to Discount of 20% on 20 or More Plates. Delivery from Stock.

Our instrument repair service on all types of instruments and clocks is certified. We design and build special instruments for the oil industry on order.

Orifice Plates for Orifice Fittings

In ordering, specify type of fitting

Size	Chrome-Moly Steel	Stainless Steel Type 302 or 304	Additional Charge for Boring
1½"	$1.80	$2.40	$.75
2	1.80	2.40	.75
3	2.00	2.70	.80
4	2.15	3.00	.85
6	4.00	5.00	.95
8	5.90	7.10	1.05
10	4.50	10.30	1.35
12	4.50	13.50	1.65
14	5.10	16.20	1.85
16	6.00	19.20	2.05

Above Prices Are for ¼" Standard Material. Prices on other sizes and thicknesses on request.

WE MANUFACTURE:
- Gauge and recorder seal systems
- Orifice well testers
- Critical flow provers
- Clocks
- Orifice plates

IN OUR STOCK ROOM WE HAVE:
- New, improved high pressure displacement oil meters
- Meter runs and straightening vanes
- Orifice flanges
- Meter manifolds
- Orifice meter leveling saddles
- Well flooder meters
- Air compressors
- Pumps—water and oil
- Differential meters
- High and low pressure hose cut to length
- Sub-surface gauges and clocks
- Pressure gauges—indicating and recording
- Charts, hydrometers, mercury, manometers, thermometers, pH boxes, oil and water displacement meters and all instrument accessories.

PRICE LIST
Handle Type—Orifice Plates

In ordering, specify flange rating

Size	Chrome-Moly Steel	Stainless Steel Type 302 or 304	Additional Charge for Boring
1½"	$3.60	$4.80	$.75
2	3.60	4.80	.75
3	4.35	5.60	.80
4	4.80	6.35	.85
6	5.60	7.15	.95
8	6.40	11.10	1.05
10	7.60	14.80	1.35
12	8.80	19.30	1.65
14	10.80	20.75	1.85
16	13.30	23.90	2.05

Above Prices Are for ¼" Standard Material. Prices on other sizes and thicknesses on request.

Hundreds of customers over two hemispheres have used our services and have called back on repeat orders. Call us on any instrument problems.

IIC

INDUSTRIAL INSTRUMENT CO.
OF ODESSA

DIAL 2671 ODESSA, TEXAS P. O. BOX 1909

MANUFACTURING-SALES AND REPAIR

a new

HIGH

in liquid-liquid contacting with KOCH KASKADE fractionating trays

The Koch Kaskade tray has set new records for efficiency, capacity and economy in liquid-liquid contacting.

Stage efficiencies up to 75%.
Capacities four times as great as in a packed column.
Better contacting without emulsification and carryover.

Koch Kaskade trays will solve your liquid-liquid extraction problems with highest efficiency and lowest cost.

For further information, write us for Bulletin O-101 and additional data on liquid-liquid extraction — no obligation.

THE KOCH ENGINEERING COMPANY, INC.

DESIGNERS • MANUFACTURERS • BUILDERS
335 WEST LEWIS STREET • WICHITA 2, KANSAS

Eastern and Export
30 Rockefeller Plaza
New York City

Pacific Coast
3311 East Slauson
Los Angeles, California

British Associates
Messrs. A. F. Craig & Company, Ltd.
Paisley, Scotland

PERSONALS

Partner Well Qualified Pipe-Line Superintendent

WALTER SIDNEY PARTNER, superintendent of Stanolind Pipe Line Co.'s Nebraska division, has had wide experience in the construction and operation of large pipe-line systems, having been in the business since the early 1900's.

He joined Stanolind in 1916 at Eldorado, Kans., as district foreman, and served in that capacity in Seminole, Okla., and Kearney and Scottsbluff, Neb. He was appointed assistant superintendent of the Salt Creek district in Wyoming in 1942 and in 1944 was named superintendent of that division. In July 1945 Partner was named area superintendent of the Nebraska division, and was placed in charge of all field work and construction of lines for Utah Oil & Refining Co. which were built under contract by Stanolind in Utah, Wyoming, and Colorado.

In 1943 he was called by the War Emergency Pipe Line to supervise laying lines on the bottom of New York harbor. These were distribution lines emanating from Linden, N. J., terminal of the Big Inch and Little Inch pipe lines.

Before joining Stanolind Pipe Line Partner worked for The Texas Co. 9 years and assisted in laying its main line from Kiefer, Okla., to Port Arthur, Tex.

Stefan Von Croy, chief geophysicist for Barnsdall Oil Co., Tulsa, was among a group of six geophysical and geological members from Barnsdall, Honolulu Oil Corp., and Seaboard Oil Co., who recently visited the Calgary, Alta., Canada, area. Others in the party included: **H. C. McCarver,** chief geophysicist, Seaboard Oil Co., Dallas; **Virgil Feather,** Honolulu Oil Corp. seismologist, San Francisco; **C. M. Cross** of Honolulu Oil Corp., San Francisco, and **D. H. Thornburg** and **W. W. Vandiver,** Seaboard Oil Co., Los Angeles.

Stanley M. McDonald, New Orleans, has been placed in charge of the newly created office of the Louisiana Land & Exploration Co. at Midland, Tex.

Gerald L. Smith, Magnolia Petroleum Co., petroleum engineer, has been transferred from the company's general offices in Dallas to the Falfurrias, Tex., producing district. Other changes in the producing division include: **James A. Graves,** promoted from district petroleum engineer at Falfurrias to assistant division petroleum engineer of the West Texas producing division at Midland; **Henry K. Holland, Jr.,** formerly district petroleum engineer at Electra, promoted to assistant division petroleum engineer of the Gulf Coast division, headquartered in Houston; **Robert W. Lewis,** promoted from petroleum engineer, Falfurrias district, to district petroleum engineer of that area; **William H. Bowie,** formerly petroleum engineer at Salem, Ill., promoted to district petroleum engineer at Electra, Tex.; **Frank E. Long,** formerly of the producing department at Falfurrias, transferred to the petroleum engineering department at Salem, Ill.; **Charles F. Girand,** made petroleum engineer at the general offices in Dallas, who will also be a member of the reserves and valuation section of the petroleum-engineering department; and **James G. Litherland, Jr.,** formerly petroleum engineer in the Louisiana-Gulf division offices at Morgan City, La., transferred to the Falfurrias district.

John E. Shannon has been promoted to assistant superintendent of the Lake Charles and Louisiana Gulf districts, Magnolia Petroleum Co. natural-gas department, headquartered in Lake Charles. **Lee E. Robinson, Jr.,** Premont, Tex., has been promoted to assistant superintendent of the Seeligson, Tex., natural-gas district.

Valentine Herbst, Jersey City, has been promoted to the position of supervisor of the process section, accounting division, Bayonne, N. J., refinery of Tide Water Associated Oil Co. He started with the company in 1918.

John P. Purcell has been promoted to the position of chief engineer of Bahrein Petroleum Co., Ltd., at the Bahrein refinery, succeeding **Carrol A. Southwell,** who is now on assignment with California Texas Oil Co., Ltd., in the Netherlands. **Leigh D. Josephson** has been named superintendent of personnel at the refinery. He formerly served as assistant refinery superintendent.

W. O. Twaits, formerly manager of the coordination and economics department, Imperial Oil, Ltd., Toronto, has been transferred to the producing department, western division, at Calgary, Alta., Canada, in the capacity of management assistant. He joined the company's manufacturing department in 1933.

D. H. Huff, who has been associated with Arkansas Fuel Oil Co., Shreveport, La., for the past 16 years and who has been serving as superintendent of that company's East Texas natural-gasoline plant near Longview, Tex., has resigned to accept a position with Sid Richardson Gasoline Co., Fort Worth. He is being placed in charge of the company's gasoline activities in West Texas, and will be headquartered in Kermit.

R. T. Short, formerly of Alice, Tex., has been named geologist of the newly created Corpus Christi district of Continental Oil Co. Others assigned to the office include: **Robert J. Ross, M. B. Morris,** and **C. F. Greenwood,** geologists; **J. P. McGowan** and **J. H. Cobb,** landmen; and **John W. McReynolds,** scout.

J. Marshall Nye, assistant manager of production operations for Sohio Petroleum Co., has resigned to join his father, **Clark C. Nye,** as an independent oil operator in Oklahoma City. He will be replaced at Sohio by **W. L. McCloy, Jr.,** formerly superintendent of operations for Sohio's eastern divisions with headquarters in Evansville, Ind. J. Marshall Nye served with Sohio 5 years in production and engineering capacities, and formerly was with Phillips Petroleum Co.

Henry Snyder, tool pusher for Danciger Oil & Refining Co. at New Iberia, La., has been transferred in the same capacity to the Harvey, La., area.

M. T. Rathvon, Casper, Wyo., vice president in charge of operations for Argo Oil Corp., will retire September 1 after 31 years' service. He will

PERSONALS

spend a portion of his time as an independent consultant in the Rocky Mountain area. He joined Western States Oil & Land Co., predecessor of Argo, in 1919 as general superintendent.

O. C. Schorp, president, and **T. R. Corbett,** manager of manufacturing, Carter Oil Co., Tulsa, will be among a group of officials from the company and its parent, Standard Oil Co. (N. J.), who will be on hand for the formal opening of Carter's new refinery at Billings, Mont., this week. Schorp will address the group and will introduce **Gov. John W. Bonner** of Montana, who will make the keynote address. The new refinery has a capacity of 20,000 bbl. daily.

O. C. SCHORP

T. R. CORBETT

Charles F. Bauer has been promoted to general foreman of the electrical department of Esso Standard Oil Co.'s Bayonne, N. J., refinery. He will be succeeded as assistant general foreman by **Russell J. Halsey.**

E. N. Durham, Shell Oil Co., Inc., Carthage, Ill., has been transferred to Oklahoma City where he will direct reservoir engineering activities in the company's Oklahoma division. He formerly specialized in waterflood projects in the Illinois division.

M. S. Mainland, fields manager of Iraq Petroleum Co., Ltd., and **A. H. R. Grimsey,** petroleum - research engineer for the company, are now visiting oil centers in the United States and were in Tulsa and Houston last week. Their headquarters is Kirkuk in northern Iraq.

Douglas Ball, petroleum engineer specializing in gas-reservoir mechanics, gas production, seismic exploration, and pipe-line operation, is now associated with **Max W. Ball,** oil and gas consultant in Washington, D. C.

Ray Harris has joined the geological staff of Lion Oil Co. in the Midland, Tex., office, which is under direction of **F. H. McGuigan.** Harris formerly was at the firm's central headquarters at El Dorado, Ark.

Hubert Y. Crouse, geologist for Carter Oil Co. at Rawlins, Wyo., has been transferred in the same capacity to Manhattan, Kans. Other changes include: **George J. Gaenslen,** geologist, tarnsferred from Denver to Oklahoma City; **C. E. Dyess,** named assistant seismograph operator at Ardmore, Okla.; **Robert B. King,** geologist, moved to Grand Rapids, Mich.; **Edward J. Laurent,** seismograph party chief, transferred from Cut Bank, Mont., to Rugby, N. D.; **Max L. Passante,** field geologist at Rawlins, Wyo., moved to Oklahoma City; **Billy F. Burke,** petroleum engineer, transferred from Shreveport, La., to St. Elmo, Ill.; and **Cecil O. Smith,** formerly seismograph party chief at Rugby, N. D., transferred to Purcell, Okla., as petroleum engineer. **Howard A. Hamilton** has joined the firm as geologist at Denver; **George Russell Lewis** has been named geologist at Oklahoma City; and **Lowell O. Green** has been named petroleum engineer at Shreveport.

B. W. Kemper, Donald G. Kendall, and **William A. Howell, Jr.,** have formed the Westmont Oil Co., in Los Angeles, and will prospect for oil in the Los Angeles Basin area.

Ronald K. DeFord, formerly chief geologist for Argo Oil Corp., Midland, Tex., and now professor in the geological department at University of Texas, Austin, is conducting field training for graduate students of the university, in cooperation with Texas Bureau of Economic Geology.

H. B. Fuqua, assistant to the vice president of producing operations for Gulf Oil Corp.'s Houston division, has resigned and has been succeeded by **B. G. Martin,** formerly of Fort Worth, who has been division geologist at Houston. Fuqua was chief geologist in the Fort Worth district until promoted to assistant to the president in 1944. He joined Gulf in 1922 at Wichita Falls, and was named chief geologist at Fort Worth in 1929. Martin joined the company in Midland, Tex., in 1928, and later served in Louisiana, and again in West Texas in 1933. He served with Petroleum Administration for War during World War II.

C. L. Butler, formerly chairman of the board of directors of Roosevelt Oil & Refining Corp., Mount Pleasant, Mich., has been named president of the company, succeeding **A. W. Winter,** who resigned. **C. L. Maguire,** formerly president of Roosevelt Oil Co., a predecessor of Roosevelt Oil & Refining, was elected a director.

Kenneth L. Smith, petroleum engineer in the Kansas district for Stanolind Oil & Gas Co., has been transferred to Levelland, Tex., where he will serve in a similar capacity.

James J. Noury, former assistant purchasing agent for Consolidated Gas Utilities Corp., has been transferred to the northern division at Blackwell, Okla.

G. O. Smith, driller's supervisor for Stanolind Oil & Gas Co., has been transferred from Crestview, Fla., to Belleville, Kans. Other changes in the geophysical department include **W. C. Wagner,** seismograph party chief, transferred from Carlsbad, N. M., to Texarkana, Ark.; and **J. R. Foster,** party chief, transferred from Minden, La., to Ardmore, Okla.

Riser Everett, Carter Oil Co., Oklahoma City, has been elected president of the Oklahoma City Geological Society. Other officers include **R. L. Roberts,** Vickers Petroleum Co., vice president; **Larry Curtis,** Sohio Petroleum Co., secretary; and **Joe Sears,** consulting geologist, treasurer.

Harve H. Mayfield, Magnolia Petroleum Co., has been promoted to assistant superintendent of the producing and drilling department for the West Texas division, headquartered in Midland. He formerly served as division petroleum engineer, and will be succeeded in that position by **Fred S. Wright, Jr. R. T. German** is division superintendent.

John J. Murray, Esso Standard Oil Co. refinery, Bayonne, N. J., has been transferred to the machinist department as foreman. He will be replaced in the maintenance-engineering division by **William R. Moore,** who was transferred from the local engineering department.

Willis J. Cree, process worker at Esso Standard Oil Co.'s Bayway, N. J., refinery for more than 30 years, has been promoted to shift foreman at the chemical-products plant. He joined the company in 1917 and has worked in pressure stills and in the cracking coils division. He became an operator in 1933, taking assignments on the solvent-finishing stills and in the alcohol-finishing section.

G. H. Fuller has been named office assistant at Esso Standard Oil Co.'s mechanical department at the Baltimore refinery. He joined the company in 1947.

Paul Wolff, formerly a consulting engineer, recently joined Barnsdall Oil Co. in Tulsa as engineering assistant to **J. T. Hayward,** vice president of company research. Since join-

ing the company he has worked with Hayward in connection with design and supervision of construction of Barnsdall's huge drilling barge in Breton Sound, off the coast of Louisiana.

Martin G. Egan and **N. W. Engel**, geologists formerly in the Evansville, Ind., office of Superior Oil Co., have been transferred to the Midland, Tex., district office.

L. Merrill Rasmussen has joined Gulf Oil Corp. at Seminole, Okla., as a petroleum engineer.

M. A. Hardie, formerly gas engineer with Montana Power Co., Butte, Mont., has joined Ford, Bacon & Davis, Inc., Kansas City, Mo., as assistant chief engineer.

Claud Hildebrand, for 27 years in the land and scouting department for Phillips Petroleum Co., has resigned from the company, and will remain in Amarillo, Tex., where he will concentrate on operation of his own oil interests.

W. A. McLaughlin, seismic party chief for Stanolind Oil & Gas Co., has been transferred from Fort Worth to Carlsbad, N. M.; **H. A. Willis** has been transferred as party chief from Stamford to Big Spring, Tex.; and **R. A. Baile**, party chief, has been transferred from the Guthrie, Okla., area to Ballinger, Tex.

SHIFTS—

R. K. Tracy, superintendent, Humble Oil & Refining Co., Dickinson, Tex., to Houston; **D. C. Rhodes**, superintendent, Humble, Freeport, to Dickinson, Tex.; **J. C. Ott**, superintendent, Humble, Waynesboro, Miss., to Beaumont, Tex.; **A. J. Chesney**, superintendent, Humble, Paradis, to Franklin, La.; **J. C. Andries**, superintendent, Humble, Columbia, Miss., to Crowley, La.; **J. S. McKinstry**, superintendent, Humble, Everglades, Fla., to Paradis, La.; **S. E. Wallette**, superintendent, Humble, Colombia, Miss., to Everglades, Fla.; **C. K. Seaman**, superintendent, Humble, Wink, Tex., to Everglades, Fla.; **W. J. Barrett**, superintendent, Humble, Everglades, Fla., to Freer, Tex.; **Delma Baucum**, superintendent, Humble, Freer, to Wink, Tex.; **E. E. Byrd**, engineer, Humble, Baytown, Tex., to Houston.

F. G. Culbertson, Jr., engineer, Humble Oil & Refining Co., Tomball, Tex., to Houston; **F. Darden, Jr.**, engineer, Humble, Encino to Midland, Tex.; **L. W. Davis, Jr.**, engineer, Humble, Sugarland to Conroe, Tex.; **A. C. Evans**, engineer, Humble, McCamey to Colorado City, Tex.; **E. G. Hays**, engineer, Humble, Genoa to Dickinson, Tex.; **W. F. Hiser**, engineer, Humble, Crowley to Grand Isle, La.; **Henry Hoffman, Jr.**, engineer, Humble, Encino, Tex., to Paradis, La.; **J. F. Jeansonne**, engineer, Humble, Fayette to Brookhaven, Miss.; **J. P. McAdams**, engineer, Humble, Houston to Lolita, Tex.; **P. L. McGee**, engineer, Humble, Pickton to Baytown, Tex.; **J. D. Moore**, engineer, Humble, Dickinson to Avoca, Tex.; **G. T. Richardson**, engineer, Humble, Pascagoula, Miss., to Grande Isle, La.

J. M. Kilborn, Gulf Research & Development Co., El Paso to Ozona, Tex.; **C. H. Austin**, superintendent, Montex Drilling Co., Levelland to Brownfield, Tex.; **C. J. Scheffler**, engineer, Shell Oil Co., Inc., McCamey to Odessa, Tex.; **Thornton Tarvin**, superintendent, Loffland Bros. Co., Houma, La., to Bay City, Tex.; **L. G. Cornish**, superintendent, Seismograph Service Corp., Lafayette, La., to Midland, Tex.; **G. W. Frank**, engineer, Phillips Petroleum Co., Jackson, Miss., to Alvin, Tex.; **D. J. Kerley**, refinery engineer, Caltex Petroleum Mij., Fushing, N. Y., to Rotterdam, Netherlands.

Paul V. Haines, Midwestern Construction Co., Forty Fort, Pa., to Madison, Ind.; **James N. Wilson**, engineer, Seismograph Service Corp., Erie, Colo., to Andrews, Tex.; **P. W. Wolf**, superintendent, Delta Drilling Co., Newcastle to Medicine Bow, Wyo.; **John B. Rush**, refinery engineer, Phillips Petroleum Co., Bartlesville, Okla., to Kansas City, Kans.; **Howard B. Shirley**, geologist, Shell Oil Co., Inc., Oklahoma City to Houston; **J. M. Garlick**, engineer, Shell Oil Co., Inc., Tulsa to Wichita Falls, Tex.; **M. J. Heald, Jr.**, engineer, Helmerich & Payne, Inc., Tulsa, to Iraan, Tex.; **W. R. S. Henderson**, geologist, British-American Oil Co., Ltd., Toronto, Ont., Canada, to Regina, Sask., Canada; **C. L. Nail**, superintendent, Wilbur E. Thomas Producing Co., Humble to Livingston, Tex.; **Philip C. Houston**, Magnolia Petroleum Co., Imperial to Andrews, Tex.

James B. Duff, geologist, Continental Oil Co., Abilene, Tex., to Casper, Wyo.; **V. M. Prichard**, superintendent, Penrod Drilling Co., Beaumont, Tex., to Oil City, La.; **S. C. Scheuber**, engineer, Amerada Petroleum Corp., Big Lake to San Angelo, Tex.; **Thomas B. Smith, II**, engineer, Stanolind Oil & Gas Co., Brownsfield, Tex., to Pottstown, Pa.; **Charles S. Percy**, geologist, Stanolind Oil & Gas Co., Corpus Christi to San Antonio, Tex.; **Jack H. Vickery**, engineer, Atlantic Refining Co., Dallas to Midland, Tex.

DEATHS

J. Elmer Thomas, 57, widely known economist and geologist, died suddenly at Fort Worth, August 20. He had recently returned from Italy where he had been a consultant for American and Italian interests. Following graduation from the University of Chicago he entered the oil business and his activities as a geologist and executive covered a large part of the United States and several foreign areas. He was one of the organizers and the first president of the American Association of Petroleum Geologists. He served with the fuels section of OPA and during most of the war period he was special assistant to the deputy administrator of PAW.

William L. Hall, 60, veteran oil-field foreman for Magnolia Petroleum Co., died in Abilene, Tex., August 15.

Hugh Vincent McGivern, 86, retired engineer for Oklahoma Pipeline Co., died in Tulsa August 19.

Charles David Thomas, 39, Tulsa, assistant to the vice president in charge of crude-oil marketing, Sinclair Oil & Gas Co., and **William Murphy**, 28, Tulsa, Sinclair pilot, were killed in an airplane crash near Tupelo, Okla., August 18.

Jesse Benjamin Hobbs, 84, independent oil man of Hardin County, Texas, died August 11 at Silsbee, Tex.

William J. Shelton, 59, owner of Shelton Oil Service, Pasadena, Tex., died August 10.

Percy Willis, gager for Humble Oil & Refining Co., Dickinson, Tex., died August 13.

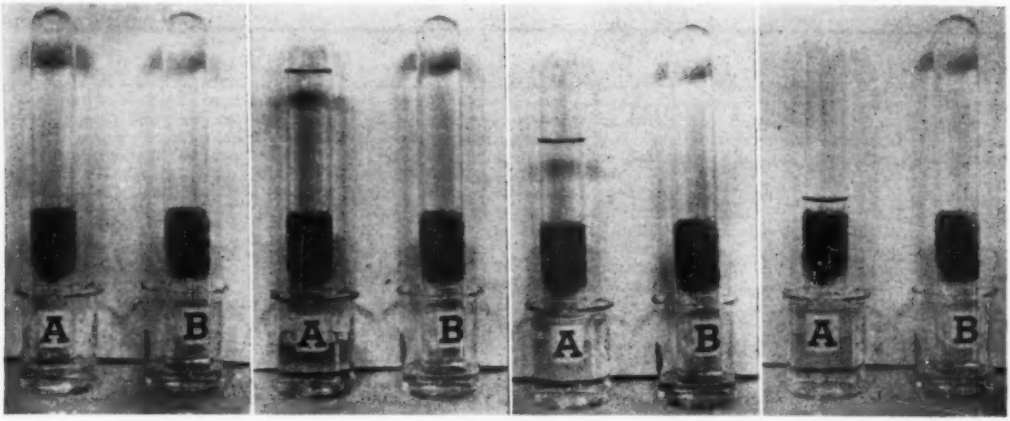
Dudley Simmons, 37, owner of Simmons & Co., oil-well supply firm, died in Houston August 11.

C. W. Faris, 39, partner with J. E. Warren in the firm of Faris & Warren, Midland, Tex., consulting petroleum engineers, died in Rochester, Minn., August 19.

George Wilson Berryman, 78, retired drilling contractor of Paola, Kans., died August 9.

Louis Platt, 80, retired auditor for Standard Oil Co. (Ind.), died in Los Angeles August 15.

Samuel H. Elliott, 74, retired oil operator and former member of the firm of Sidwell, Hiatt & Elliott, died recently in Winfield, Kans.



START ½ HOUR 1 HOUR 1½ HOURS

Fig. 1—Test-tube experiment with dilute acid corrosion inhibitor. Steel wool in .15 per cent HCl. Tube A contains uninhabited acid solution. Tube B contains acid plus 10 p.p.m. alkyl amine acetate. Amount of gas indicates degree of acid corrosion

NEW CHEMICAL TREATMENT OF FLOOD WATER FOR *Bacteria and Corrosion Control*

by Joseph N. Breston*

THE role that bacteria play in water-flood operations has been widely reported[1,2,3,4,5], and numerous observations may be cited which indicate that bacteria are very effective in plugging the sand faces in water-input wells. This plugging causes a gradual and often rapid decline in the water-injection rate which reflects in lower oil-recovery rates. Treating with chlorine, copper sulfate, phenol derivatives and the like are very useful in minimizing the bacteria problem. For permanent treatment the concentrations of these bactericides have to be raised to the point where secondary problems arise such as corrosion by too high a concentration of residual chlorine. Slug feeding of sodium hypochlorite[5] is very effective in cleaning out bacteria-infested lines and water-injection wells but most often the effect is not permanent and follow-up treatments are needed.

Similarly, acidic corrosion of pipe and other equipment could seriously hamper the efficient operation of a water flood. Besides leak trouble and the cost of replacing lines, slight aeration of such acidic water causes a precipitation of the products of corrosion, which, if carried into the injection well, will plug the face of the sand. However, it has been noted[6,7,8] that clay-containing sands have a higher permeability to acid water than to neutral or slightly alkaline waters. Thus, it has been considered desirable to treat the water for acid corrosion without raising the pH. Another advantage of the acidic flood water is the inhibiting effect it has on bacteria multiplication, especially in the presence of certain organic bactericides.

Search for Additive Inhibitor

About 3 years ago, after the virtues of acidic flood waters were established by tests in the Bradford laboratory of the Pennsylvania Grade Crude Oil Association, a search was made for an acid corrosion inhibitor which could be added to the flood water to protect the pipe and metal equipment in a field experiment. The preliminary results of the search were reported by Breston[9] in which are described the effects of certain organic amine salts in materially reducing corrosion by acid water. Small-scale field tests proved the applicability of such treatment and indicated that the cost would be very low since the chemicals used were effective at the extreme dilution of only a few parts per million.

Until 1947 all attention was focused on the use of these amines in mildly acid water (pH 2.5-3.5). During the summer of 1947 the Pennsylvania Grade Crude Oil Association laboratory and the producing division of Quaker State Oil Refining Corp. conducted a cooperative experiment to test the effectiveness of one of the amine salts, rosin amine D acetate, in reducing corrosion in the water-injection system of a small lease using air-free water which was only very slightly acid (pH 6.0). The report by Breston and Barton[10] on the results of this experiment also gives an account of the first tests of the bactericidal properties of this amine. Bacteria counts showed the treatment to have reduced the bacteria multiplication beyond expectations. This startling discovery opened the way toward more intensive laboratory and field research into these bactericide-corrosion inhibitor compounds.

Since 1947 laboratory research on these bactericide — corrosion inhibitors has been conducted along the following lines:

1. Development of test methods for screening bactericides and corrosion inhibitors for use in flood water.

2. Search for more effective bactericide — corrosion inhibitors which

*Laboratory director, Pennsylvania Grade Crude Oil Association, Bradford, Penn. Paper presented at the American Petroleum Institute Eastern District Committee meeting on secondary recovery methods, Pittsburgh.

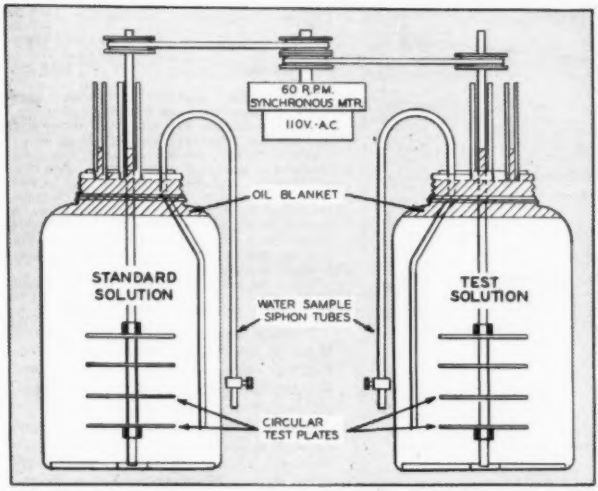


Fig. 2—Spinning-disk corrosion test apparatus

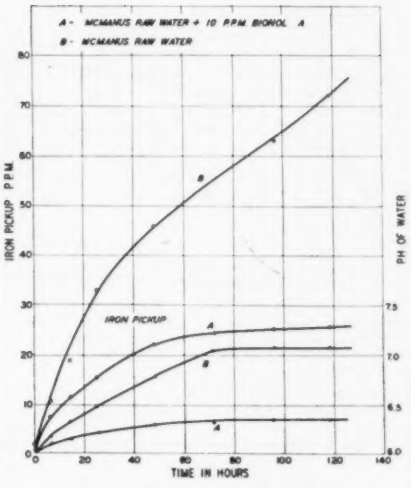


Fig. 3—Spinning-disk corrosion test No. 27

are more compatible with the usual raw waters and with oil field brines.

3. Determine what chemical types have the greatest bactericidal qualities.

4. Determine what chemical types have the greatest corrosion-inhibiting qualities.

5. Determination of the surface-active properties of these bactericide—corosion inhibitors.

The results obtained to date are the subject of this paper.

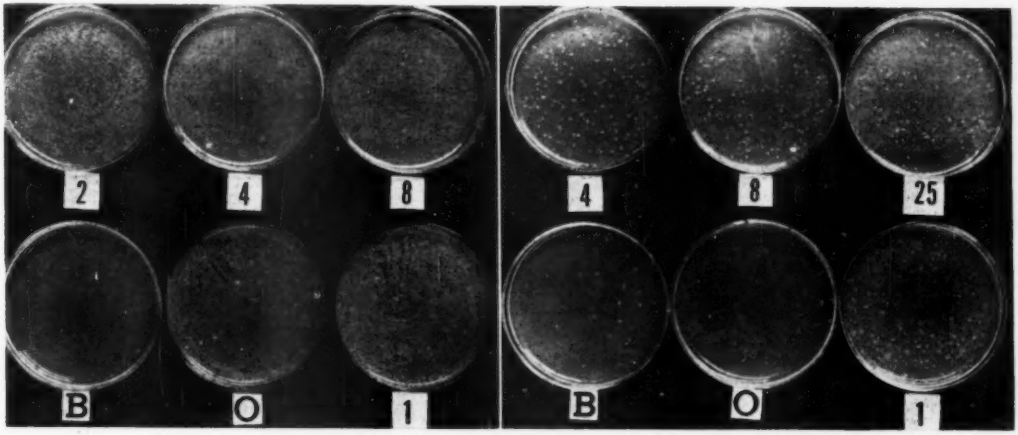
Test Methods

Corrosion-inhibitor test.—A simple tset-tube method for detecting acid corrosion-inhibiting properties which has been described in a previous paper[3] is illustrated in Fig. 1. This test and another test described in that paper may be used for screening possible corrosion inhibitors. However, such tests are only static tests and results are mostly qualitative. The need for a dynamic test which will give results that are quantitative led to the development of the spinning-disk corrosion-inhibitor tester illustrated in Fig. 2. As diagramed, the apparatus was constructed to provide the following conditions:

1. Testing under air-free conditions.
2. Dynamic testing whereby the test water flows past the metal test coupons.
3. Sampling device whereby the water may be checked for change in pH and iron content. These two properties afford a quantitative measure of the rate and degree of corrosion.
4. Simple construction of nonmetallic materials.

Condition No. 1 was satisfied by keeping a medicinal mineral-oil blanket over the water reaching up into the plastic tubes. Incidentally, this oil also provided lubrication for the glass shaft inside the center tube. Condition No. 2 was satisfied by having the test coupons spinning in the water. The rotation is provided by a small synchronous motor which is belted to the shaft holding the test coupons or disks. A siphon-type sampling tube is inserted into each jar providing the water-sampling facili-

Fig. 4—Effect of bactericide on growth of aerobic bacteria found in oil-field flood water. Peptone agar plate with 1 per cent sodium chloride. Numbers indicate concentration of bactericide in parts per million. Plate marked B was not inoculated with bacteria. Bactericide used was lauryl pyridium chloride



CULTURE A CULTURE B

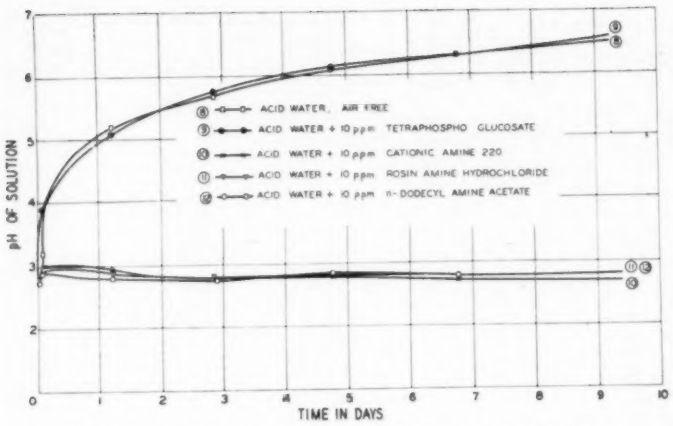

pH OF SOLUTION
TIME IN DAYS
ACID WATER, AIR FREE
ACID WATER + 10 ppm TETRAPHOSPHO GLUCOSATE
ACID WATER + 10 ppm CATIONIC AMINE 220
ACID WATER + 10 ppm ROSIN AMINE HYDROCHLORIDE
ACID WATER + 10 ppm n-DODECYL AMINE ACETATE

Fig. 5—Action of acid corrosion inhibitors on steel wool in raw (hard) water

ties required by condition No. 3. Condition No. 4 was easily arranged for by using glass jars and glass shafts to hold the disks, rubber spacers between disks, plastic tubes, plastic cover plate, and plastic bottom bearings.

Operating procedure is very simple. The bottom bearing is inserted into the jar and the water under test siphoned in carefully to keep the dissolved air to a minimum. Any inhibitors or other chemicals are then added at this point. Then the weighed test coupons, or disks, which have been previously sanded, and cleaned with naphtha and acetone, are strung on the glass shaft and the assembly lowered into the jar. A thin fiber gasket is placed on the mouth of the jar and the plastic cover plate is lowered on so that the shaft protrudes through the center tube. A metal ring is then screwed on to hold the cover plate in place. The shaped plastic siphon tube is next inserted through a hole in the cover plate and fastened by a rubber bushing. Mineral oil is then added through one of the side tubes. Using a rubber bushing in the center, the pulley is then slipped on the glass shaft and belted to the motor. Immediately samples are taken for pH and iron content determination and the test is ready to begin. Determinations of the pH and iron content of the water are made at frequent intervals using a minimum sample of water. An equal volume of mineral oil is added to the jars to replace the sampling water. The pH and iron content values are plotted against time, typical curves of which are illustrated in Fig. 3.

Test for bactericidal properties.—Since it was found[1,2] that a multitudinous variety of bacteria types are common to oil-field waters, laboratory tests could not be considered representative if the bactericides were tested on only a few bacteria types. Fig. 4 illustrates how a bactericide might be effective in killing one type of bacteria and be relatively noneffective in killing another type. Hence, it was decided to test the bactericides on actual oil-field waters which were polluted with the more common types. The bacteria most common in the waters used in the tests were members of the genus Pseudomonas and genus Serratia.

The testing of the bactericide-corrosion inhibitors for their bactericidal powers was performed in the bacteriology laboratory of St. Bonaventure College by Dr. Kenneth E. Anderson. The test procedure is outlined as follows:

1. Sterile water, pipettes, petri, dishes and containers were used in all experiments.

2. A stock solution of the disinfectant to be tested was prepared. The solution was made up to give a .0001 concentration of the disinfectant.

3. A supply of contaminated water was added to several sterile bottles and then brought to a temperature of 20° C. in a constant-temperature water bath.

4. The stock solution of the disinfectant to be tested was added to the bottles of test water to give various concentrations of the disinfectant. The total volume of the solution was standardized at 100 ml. For example: To obtain a concentration of 2 p.p.m., 2 ml. of the .0001 stock solution of the disinfectant was added to 98 ml. of the test water.

5. One bottle was prepared containing no disinfectant to be used as a control.

6. The disinfectants were added at 10-minute intervals and allowed to act for 30 minutes at 20° C. At the conclusion of the incubation period, the samples were tested aerobically and anaerobically for the number of bacteria and molds in the solutions.

a. Aerobic method: The aerobic organisms were counted by plating out various dilutions of the water sample on the following agar in petri dishes:

Peptone (Difco)	10 g.
K_2HPO_4	0.5 g.
$MgSO_4$	0.2 g.
NaCl	0.1 g.
$FePO_4$	Trace
Agar	17.0 g.
Distilled water	1000.0 ml.

b. Anaerobic method: Dilutions were made in deep tubes of the above medium. This excluded any air from the tubes and allowed the anaerobic bacteria to grow.

7. The bottle containing only the test water was analyzed immediately upon the addition of the test water to the water bath and again at the end of the 30-minute incubation period. This served as a control and gave the number of bacteria at the start of the experiment and at the end of the incubation period in an untreated sample.

8. The plates and tubes were incubated at 27°-28° C. for 7 days and the number of bacteria and molds determined.

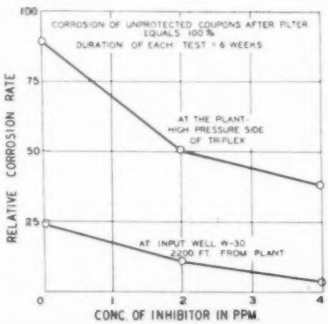

CORROSION OF UNPROTECTED COUPONS AFTER FILTER EQUALS 100 %
DURATION OF EACH TEST = 6 WEEKS
RELATIVE CORROSION RATE
AT THE PLANT-HIGH PRESSURE SIDE OF TRIPLEX
AT INPUT WELL W-30 2200 FT. FROM PLANT
CONC. OF INHIBITOR IN PPM.

Fig. 6—Rosin-amine acetate inhibitor tests. Quaker State-McManus lease

Testing surface-active properties.—Most of the bactericide-corrosion inhibitors tested had surface-active properties. Since any detergent properties due to surface activity could be considered useful in cleaning the sand surface in an injection well, the measurement of this property was considered important. Consequently determinations were made of the surface tension between air and water solutions of these compounds, and also of the interfacial tension between crude oil and the water solutions of these compounds.

The surface tensions were made with a duNouy tensiometer by the platinum-ring method and the interfacial tensions were determined for both directions in passing through the oil-water interface. Corrections were applied for temperature variation and time of contact between oil and water. Otherwise the procedure was standardized so that very reproducible results could be obtained. The surface-active properties were determined on solutions of 5, 10, 20, 50 and 100 p.p.m. of the surface-active agent. Due to differences in the adhesion properties of the oil and water with respect to the ring considerable differences were noted in the interfacial tension measurements depending on the direction in which the ring was passing through the interface. However, since detergent qualities are more often associated with removing oil from a solid surface, only the values of interfacial tension measured when going from oil into water are reported in this paper.

Results and Discussion

Corrosion-inhibiting properties.—Using the spinning-disk corrosion-inhibitor test apparatus, determinations were made of the relative effectiveness of various bactericide-

TABLE 1—McMANUS WATER ANALYSIS
(April 11, 1949)

Test—	Analysis
Temperature, °F.	49
pH	6.0
Hardness, p.p.m.	176
Ca, p.p.m.	132.2
Alkalinity to methyl orange, p.p.m.	36.0
Chlorides, p.p.m.	264
Carbon dioxide, p.p.m.	41
Sulfate, p.p.m.	20
Dissolved oxygen, p.p.m.	1.30
Iron (total), p.p.m.	0.2

TABLE 2—SPINNING-DISK TESTS OF CORROSION INHIBITORS

(Tests made in air-free raw water at 70° F. with 10 p.p.m. of various bactericide-corrosion inhibitors. Effectiveness calculated on basis of relative rise in pH and iron pickup of treated and untreated water)

Test No.	Inhibitor—	% Effectiveness of inhibitor	Iron loss, in./yr.	Max. pH of treated water*
12	Cationic amine 220	67	.00049	6.45
25	Cationic amine 220	66	.00051	
27	Bionol A	65	.00052	6.35
24	Arquad 2C (slow test)	56	.00065	6.6
18	Arquad 2C (fast test)	64	.00054	6.7
14	Armac TO	56	.00065	
21	Arquad C	55	.00067	6.8
6	Armac C	44	.00083	6.85
29	Arquad S	44	.00083	6.55
15	X5603-29	43	.00085	6.8
28	Purosan 3	43	.00085	6.42
16	Purosan 2	41	.00088	6.95
20	Rosin amine D acetate	38	.00092	7.0
	Untreated raw water		.00149	7.20

*Final equilibrium pH.

corrosion inhibitors with respect to a standard raw flood water. The general analysis of this water is found in Table 1. Table 2 lists the results obtained on 11 compounds which are commercial products and showed promise of being good bactericide-corrosion inhibitors. The per cent effectiveness is calculated on the basis of relative rise in pH and iron pickup of treated and untreated water. The iron loss in inches per year calculated on a basis of uniform corrosion is very low by ordinary standards. However, a 0.001 in. of iron from the inside of a few thousand feet of 1 and 2-in. pipe if converted to iron hydroxide can seriously plug the sand face of an injection well.

The last column in Table 2 lists the maximum pH attained by the treated water in these tests. It will be noted that there is a general trend for the more effective inhibitors to stabilize the water at a lower pH. In other words, iron loss by the test coupons is completely arrested at or above that pH. This is well illustrated in Fig. 3. The significance of this property has not yet been analyzed, but it appears to be a function of the type of chemical used and the thickness of the protecting film absorbed onto the metal. The relation of the motion of the water past this adsorbed film to the effectiveness of the inhibitors is indicated by comparing the results of three inhibitors tested under static conditions and then under dynamic conditions. Fig. 5 shows that cationic amine 220, rosin amine hydrochloride (acetate), and n-dodecyl amine acetate (armac C) are all equally effective in completely arresting acid corrosion under static conditions for at least 10 days while spinning-disk corrosion tests listed in Table 2 show them to be only 67, 38, and 44 per cent effective under dynamic test conditions.

The spinning-disk corrosion test although designed to reproduce conditions in the field is not exactly representative of a field test. It was originally designed as a rather severe test for screening out promising inhibitors from the general run of chemicals tested. If a chemical passed the test it most surely should have some effectiveness in the field where the properties of the water were similar to those of the water used in the laboratory test. Even then, the relative effectiveness in the field may differ as is shown in the results obtained on one lease with rosin amine D acetate. Fig. 6 illustrates the effectiveness at 4 p.p.m. concentration to be between 57 and 85 per cent while the laboratory spinning-disk test indicates it to be only 38 per cent effective at 10 p.p.m. concentration.

Another field condition which is often encountered and whose effect on inhibitors can be demonstrated in the laboratory is the presence of oil traces in the water or lines. Fig. 7 illustrates vividly how a film of oil on the metal test coupons can act as a natural inhibitor and how it can enhance the effectiveness of an added inhibitor. This can be a considerable effect if a strongly cationic surface-agent, such as rosin amine D acetate, is used since it can cause metal and also metallic oxides to become fairly coated with a thin film of oil. This property of cationic surface-active compounds is commonly used in ore-flotation processes.

One interesting test was made comparing the relative effectiveness of an amine and of standard treatment in stabilizing and making noncorrosive an oil-field flood water. The raw water was air free with a pH of 5.75 and had medium hardness and iron content. The treated water was the same except for conventional treatment by aeration, lime, and calgon. The results of the spinning-disk corrosion tests are illustrated in Fig. 8. Up to the 35-hour mark the dissolved iron pickup was about the same for both waters. The amine-treated water changed very little from there on while the iron pickup for the treated water was indeterminate due to precipitation of iron from solution. It should be noted that the pH of the amine-treated water remained constant at 6.1 after 30 hours while that of the treated water kept declining.

An insufficient number of compounds have been tested to definitely determine which chemical types

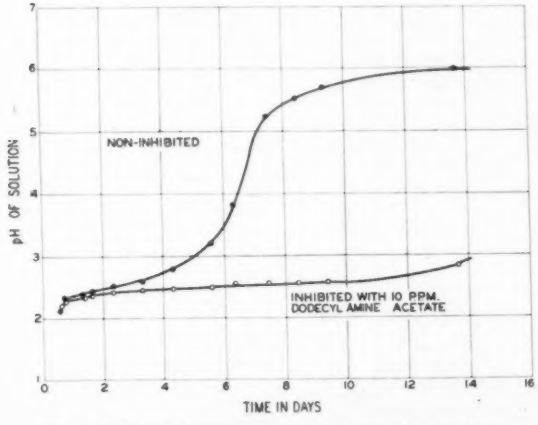


Fig. 7—Spinning-disk corrosion test No. 3. Film of oil on plates

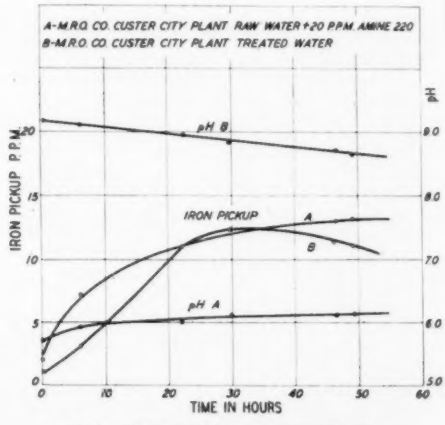
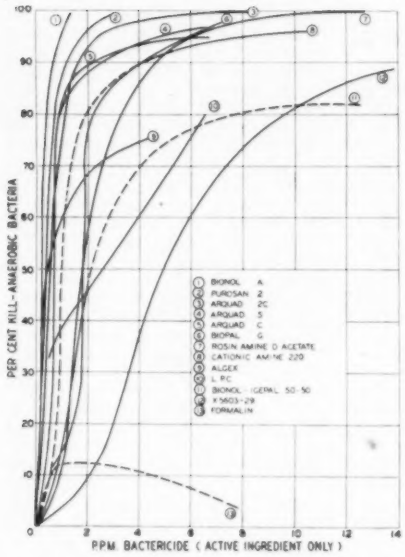


Fig. 8—Spinning-disk corrosion test No. 26



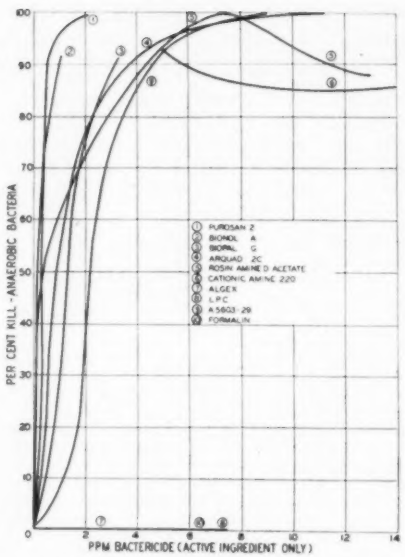


Fig. 9—(Left) Effectiveness of various bactericides in killing aerobic bacteria in Gates flood water. Fig. 10—(Right) Effectiveness of various bactericides in killing anaerobic bacteria in Gates flood water

are the most effective inhibitors, but it has been fairly well established that both alky and aryl high-molecular-weight amine salts and certain condensed ethylene oxide-amine compounds should have acid corrosion-inhibiting properties. Whatever the relative effectiveness of a compound may be, of necessity it will have to be balanced with its effectiveness as a bactericide to be considered generally promising as a combination bactericide-corrosion inhibitor. There is also the possibility of using in combination one compound which is an effective bactericide and another which is an effective corrosion inhibitor. Some research is in progress on this phase before a definite evaluation of their effectiveness in brines can be determined.

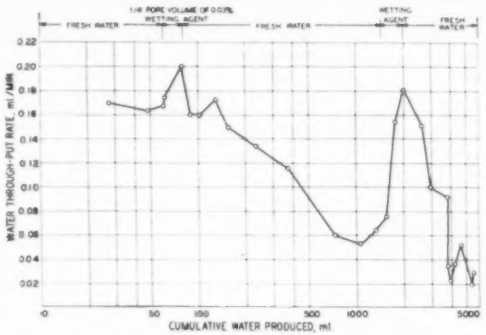


Fig. 11—Flooding experiment with nonionic wetting agent on long core of oil sand. (5.5 cm. diameter, 15 cm. long)

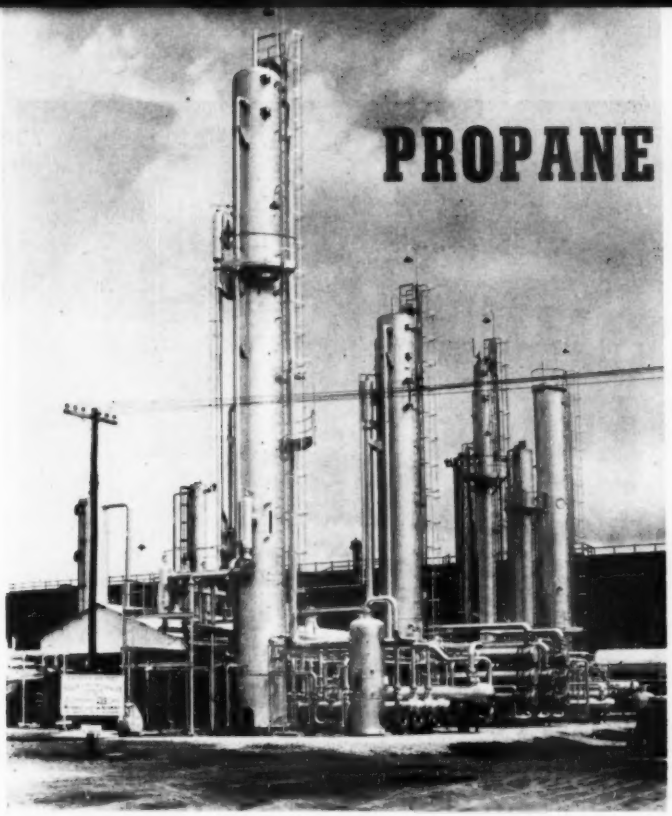
Bactericidal properties.—Following the test procedure outlined under the section entitled "Test Methods" a total of 13 potential bactericide-corrosion inhibitors were tested for their bactericidal powers with respect to aerobic and anaerobic bacteria. The effectiveness was determined on a basis of the per cent kill at specific concentrations of the bactericide. The results obtained on aerobic bacteria are illustrated in Fig. 9 and those obtained on anaerobic bacteria are illustrated in Fig. 10. The shape of the curves for aerobic and anaerobic bacteria are very similar and the bactericides showing high percentage kills of aerobic bacteria are also lethal to anaerobic bacteria.

To be considered satisfactorily effective, a bactericide should show

(Continued on page 124)

TABLE 3—SOURCE AND COMPOSITION OF BACTERICIDES AND INHIBITORS

Designation and composition—	Source
(1) Bionol A—25% solution of alkyl (C_7 to C_{19}) dimethyl benzyl ammonium chloride	General Dyestuff Corp.
(2) Purosan 2—10% solution of alkyl (C_9H_{11} to $C_{18}H_{37}$) dimethyl benzyl ammonium chloride + X	Purosan Co.
(3) Arquad 2C—75% paste of di-fatty alkyl quaternary ammonium chloride	Armour & Co.
(4) Biopal G—31% solution comprised of one part Bionol A (alkyl dimethyl ammonium chloride, 25%) and four parts of igepal CA (a poly ether alcohol condensate non-ionic wetting agent, 33%)	General Dyestuff Corp.
(5) Rosin amine D acetate—70% paste of rosin amine acetate	Hercules Powder Co.
(6) Cationic amine 220—A liquid approximately 95% 1-hydroxyethyl-2-heptadecenyl glyoxalidine	Carbide & Carbon Chemicals Corp.
(7) Algex—10% solution of alkenyl dimethyl-ethyl ammonium bromide	Modern Swimming Pool Co., New Rochelle, N. Y.
(8) L.P.C.—30% solution of lauryl pyridinium chloride	Hooker Electrochemical Co.
(9) X5603-29—A paste approximately 95+% condensed ethylene oxide rosin amine D	Hercules Powder Co.
(10) Formalin—40% solution of formaldehyde	
(11) Armac C—75% paste of n-dodecyl amine acetate	Armour & Co.
(12) Arquad S—33% paste of alkyl (C_{18} to C_{18}) trimethyl ammonium chlorides	Armour & Co.
(13) Purosan 3—10% solution of alkyl dimethyl benzyl ammonium chloride +X (wetting agent)	Purosan Co.
(14) Igepal CA—33% solution of a poly ether alcohol condensate non-ionic wetting agent	General Dyestuff Corp.



General view of the new process equipment in Warren's Gladewater plant, showing pump shed on the left, the main absorber with intercoolers, the rich-oil deethanizer and heat-exchange equipment, the reabsorber, condensate deethanizer, and still

PROPANE RECOVERY

Increased from

68 to 92 Per Cent

at Warren's Gladewater, Tex., plant since the installation of new absorption-oil system

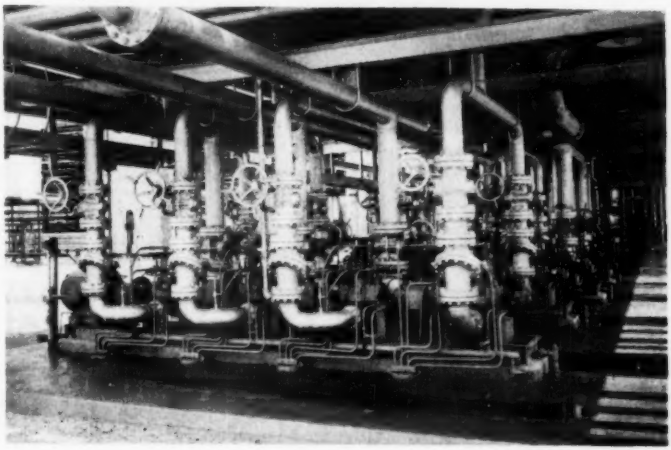
That it pays to modernize is aptly illustrated by the new process units recently installed at the Gladewater, Tex., absorption plant of Warren Petroleum Corp. By replacing older equipment with modern units, the over-all propane recovery at this plant under summer operating conditions has been raised from 68 to 92 per cent, with a simultaneous reduction of 20 per cent in the over-all plant fuel consumption and 60 per cent in the over-all plant steam requirements.

by W. S. McAllister*

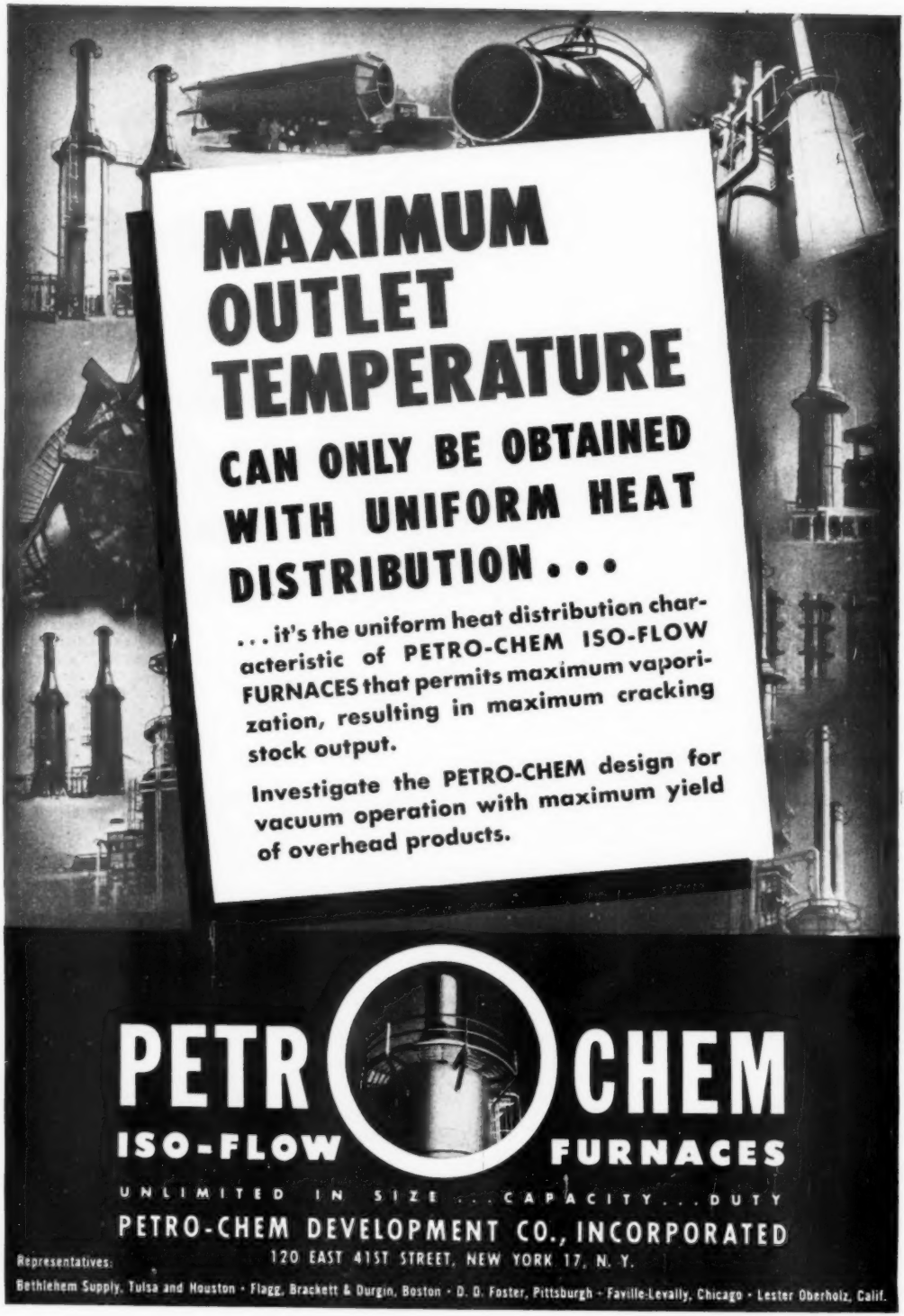
THE Gladewater plant of Warren Petroleum Corp. was constructed during the initial development of East Texas field for the purpose of extracting 26-lb. natural gasoline from the extremely rich gas (4.0 gal. per M.c.f.) available at the separators of Woodbine formation wells. In 1936, with the development of the butane market, the plant was enlarged to extract 95 per cent of the butanes available. This was done by installing a new absorption oil system using 90-molecular-weight oil, in series with the conventional absorption system already in use.

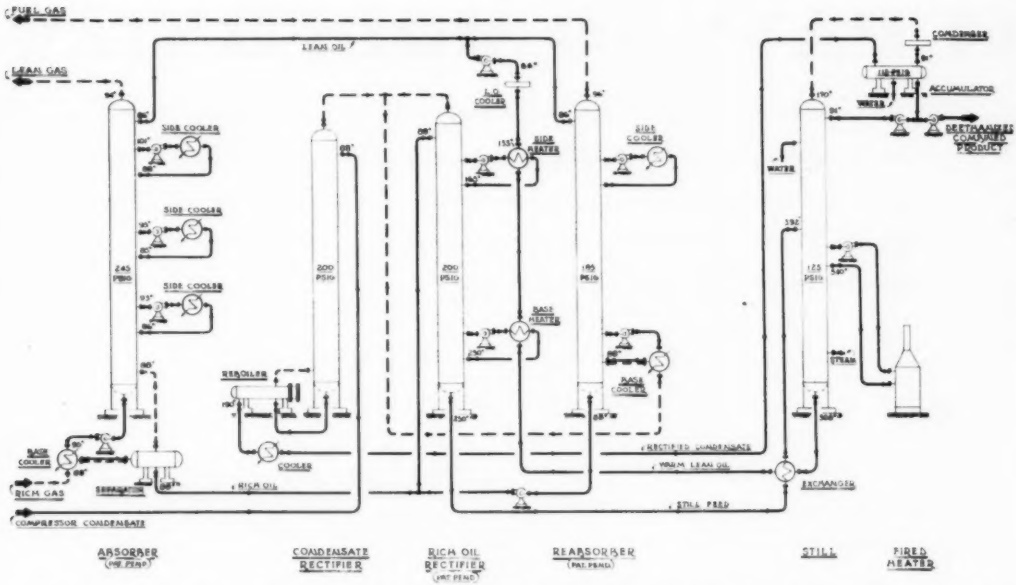
For the light-oil system, propane refrigeration was used and both the gas and oil were chilled to 40° F. Residue gas from this refrigerated absorber passed on to the conventional absorber which picked up the heavier fractions and a small percentage of the lighter fractions. In 1945, as commercial propane was becoming more valuable, it was decided to retain substantially all of the propane that this system extracted by the use of additional recompressors and a 500-psi.-operating-pressure product deethanizer. This system produced in tanks from 55 to 70 per cent of the 6.0 gal. per M.c.f. of propane available, depending upon weather and load conditions.

Intercocler pumps and rich-oil deethanizer circulating pumps. All pump piping is suspended from the pump-shed structure by spring hangers



*District superintendent, Warren Petroleum Corp., Gladewater, Tex.


MAXIMUM OUTLET TEMPERATURE
CAN ONLY BE OBTAINED WITH UNIFORM HEAT DISTRIBUTION . . .
. . . it's the uniform heat distribution characteristic of PETRO-CHEM ISO-FLOW FURNACES that permits maximum vaporization, resulting in maximum cracking stock output.
Investigate the PETRO-CHEM design for vacuum operation with maximum yield of overhead products.
PETR CHEM
ISO-FLOW FURNACES
UNLIMITED IN SIZE . . . CAPACITY . . . DUTY
PETRO-CHEM DEVELOPMENT CO., INCORPORATED
120 EAST 41ST STREET, NEW YORK 17, N. Y.
Representatives:
Bethlehem Supply, Tulsa and Houston • Flagg, Brackett & Durgin, Boston • D. D. Foster, Pittsburgh • Faville-Levally, Chicago • Lester Oberholz, Calif.



Process flow arrangement of the absorption cycle at the Gladewater plant of Warren Petroleum Corp. (Diagram courtesy of J. B. Gill Co., Los Angeles)

In 1948, due to the continued high demand for propane, it was decided to again revise the plant to recover 90 per cent or more of propane. Due to the fact that this plant employing two stills was not too efficient because of the high steam and process fuel consumption, and because of the obsolescence of some of the equipment, it was decided to rearrange the plant by eliminating the refrigeration system and going to 250 psi. absorption pressure.

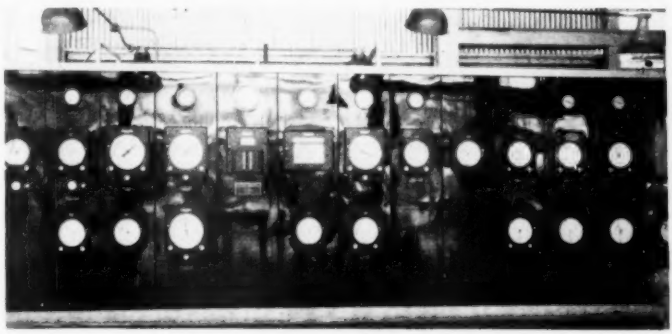
After studying various process design arrangements, a scheme was selected which called for installation of complete new absorption and distillation equipment, elimination of refrigeration, and continued use of existing product fractionators, stem plant, electric generating facilities, and cooling tower. The second stage of compression was accomplished by using the five excess 230-hp. refrigeration machines, the two excess 230-hp. recompressor machines, and two of the existing 230-hp. first-stage machines.

Compressor-cylinder changes were necessary only in converting the two first-stage compressors and the recompressors as the cylinder sizes on the refrigeration machines were satisfactory for the new condition. A minimum of expense resulted in making this change as all of these compressors were located in one end of the compressor building and all of the headers and piping were used with only minor changes. The propane condensers were used as second-stage gas coolers and the propane accumulator tank was used as the second-stage condensate receiver with no changes in the piping necessary.

As a result of these changes, the plant's over-all propane recovery has been increased from 68 to 92 per cent under summer operating conditions, with a simultaneous reduction of 20 per cent in the over-all plant fuel requirements and a substantial decrease in the plant steam requirements. The cooling-tower load also has been decreased in keeping with the reduction in plant fuel and steam loads, while no increase has been called for in the electric-power load.

It should be pointed out that the incoming load to any plant in East Texas field varies markedly from hour to hour and from day to day in spite of constant attention to scheduling flows. This is due to the fact that many of the wells will flow their 20-bbl. allowable in as little as 30 minutes. For this reason, it is necessary to design for peaks considerably above the average plant load conditions.

The process arrangement of the new absorption and distillation equipment is shown in the flow diagram, Fig. 1. As indicated on the diagram, the main process equipment consists of a side-and-base-cooled 250-psi. main absorber, a special condensate and rich-oil deethanizing column group consisting of a condensate deethanizer, rich-oil deethanizer, and side-and-base-cooled reabsorber. A single 125-psi. still using a direct-fired heater is used which operates with total condensation of the overhead vapors. The general process flow of rich gas, condensate, absorption oil, and product streams through these units is evident from the flow diagram. All of the instrumentation and equipment



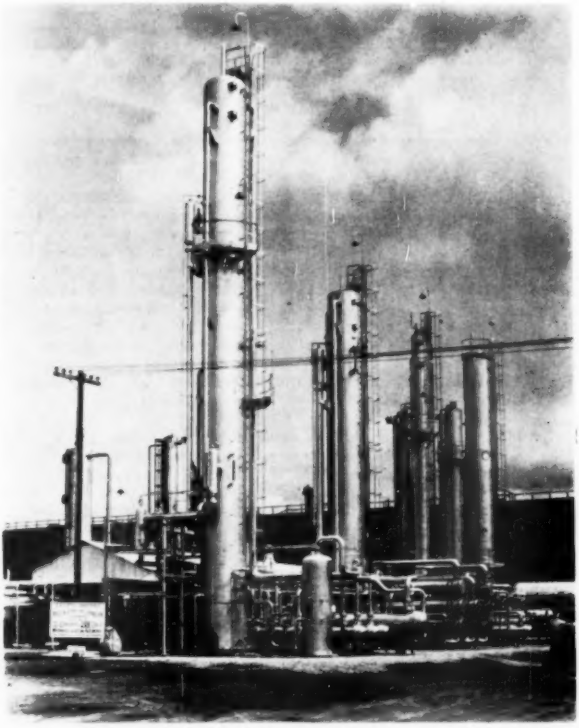
The central control panel is located in the pump shed

IT PAYS TO MODERNIZE

The modernized natural gasoline plant of Warren Petroleum Corp. at Gladewater, Texas, is resulting in real operating benefits. Incorporating a new Base Cooling Cycle (patents pending), the performance is exceeding its guarantee. J. B. Gill Company can modernize *your* plant at minimum outlay and bring you substantial operating economies.

Note these features of the Gladewater plant, listed below, as taken from the acceptance test.

- **92% Overall Plant Propane Recovery.**
- **23.4 Absorber Oil Gas Ratio at 245 lb. without Refrigeration.**
- **True Rich Oil Deethynization with Maximum Heat Economy and fully Automatic Control to Handle Rich Gas Composition Fluctuations.**
- **Single 125 lb. Still Operation using 0.076 lb. Stripping Steam per Gallon Lean Oil.**
- **No Plant Vapor Recycle.**
- **Substantial Investment Saving.**



J. B. GILL COMPANY

ENGINEERS AND CONSTRUCTORS

2901 ORANGE AVENUE, LONG BEACH 1, CALIFORNIA

employed in the revised layout was designed specifically to take care of extreme variations in the incoming plant load.

Main Absorber

Three pump-circulated side intercoolers are used at the main absorber due to the extreme richness of the incoming feed gas, the pump circulation being employed both to insure full flow of rich oil through these side coolers and for reduction of cooler surfaces as a result of the better heat transfer obtained with forced circulation. The side streams are cooled some 13°, 10°, and 7° F., respectively, at the three coolers with the top cooler carrying the heaviest load.

In addition to the three conventional side coolers, a special base-cooling unit is also employed at the main absorber. At this base unit the incoming rich-gas stream is contacted with rich-oil bottoms from the absorber at what, in essence, is the bottom theoretical tray of the absorption unit. As a result of the simultaneous absorption and heat extraction thus effected, approximately 40 per cent of the total propane, 80 per cent of the total butanes, and 93 per cent of the total pentanes absorbed, are picked up by the rich oil at this unit.

The main absorber employs 30 perforated plate trays designed especially to give maximum over-all absorber efficiency with extreme variations in gas and oil loading. Propane absorptions of the order of 93 per cent are obtained with this column using reasonable oil rates and operating at temperature levels attainable with a simple, atmospheric-type cooling tower.

Deethanizing Columns

The deethanizer section utilizes three columns consisting of a conventional base-heated condensate deethanizer, a special side-and-base-heated rich-oil deethanizer, and a side-and-base-cooled reabsorber.

Due to the large amount of condensate produced in compressing the low-pressure intake gas to 250 psi. for the main absorber operation, sufficient condensate is produced to justify using a separate column for removal of the ethane and lighter fractions from this stream. The rich-oil deethanizer, the heat exchangers, and side and base heaters are arranged to give a high degree of heat utilization. This is evident by the low temperature of the lean oil returning to the coolers which ranges from 125° to 135° F.

As with the main absorber, pump-circulated side-and-base coolers are employed at the reabsorber. Only one side cooler is used, however, instead of the three of the main absorber, due to the smaller quantities of materials handled at the reabsorber unit.

The high over-all efficiency attained with the combined condensate and rich oil deethanizing unit is attested by the fact that it regularly retains 93-96 per cent of the propane recovered in the condensate and 250-psi. rich oil, while utilizing less than 20 per cent of the volume of lean oil employed at the main absorber. This deethanizing system produces a specification quality combined product with no vapor recirculation off the stripping-still accumulator.

Fire-Heated Still

Only a single still is used for stripping the absorption oil although the deethanizer raw product contains so much propane that some 112-psig. pressure is required to hold the combined liquid product in the surge tank under summer operating conditions. This pressure on the surge tank requires the still to operate at 125-psig. pressure.

By the employment of specially designed perforated plate trays (of which there are four different layouts in this one column), coupled with relatively high still operating temperatures (540° F. at the heater-coil outlet), an extremely sharp cut is made between the raw-product end point and the lean-oil initial using only 0.075 lb. of steam per gallon of lean oil circulated, or about one-third that normally expected for the still pressure employed.

TABLE 1—KEY OPERATING FACTORS, GLADEWATER ABSORPTION-PLANT ACCEPTANCE TEST

Rich-gas intake—	Mol. %	Gal. per M.c.f.
Methane and air	45.95	
Ethane	12.04	
Propane	21.05	5.764
Isobutane	3.77	1.230
Normal butane	9.14	2.875
Isopentane	2.62	0.956
Normal pentane	2.30	0.829
Hexane plus	3.13	1.278
Total	100.00	12.932
Over-all propane recovery—		
Propane to shipping tanks—Per cent of plant intake		92
Main "base-cooled" absorber—		
Operating pressure, psig.		245
Lean absorption oil:		
Rate—Gals. L.O. per M.c.f. rich gas to base cooler		23.4
Molecular weight		172
Temperatures:		
Lean oil to absorber, °F.		86
Rich gas to base cooler, °F.		88
Rich oil from base cooler, °F.		88
Rich-oil deethanizer and reabsorber—		
Operating pressures, psig.		200-185
Lean oil rates:		
Gal. L.O. per M.c.f. rich gas to reabsorber		27.5
Per cent of lean oil to main absorber		19.7
Temperatures L.O. to water cooling coils, °F.		133
Approach to R.O. temperature from main base-cooler, °F.		45
Approach to lean oil temperature, °F.		47
Stripping still—		
Operating pressure, psig.		126
Steam rate—lb. steam per gal. lean oil		0.076
Stripping effectiveness:		
Gasoline end point, °F.		286
Lean oil initial, °F.		360
Temperature "spread," °F.		74
Fired heater outlet, °F.		540

The data in Table 1 present operating characteristic highlights of the above-described process units. These figures were developed during the plant acceptance test, conducted under average summer operating conditions, in which the over-all propane recovery in the plant shipping tanks averaged 92 per cent of the plant intake.

The plant is completely instrumented for full automatic control of a widely fluctuating feed rate. As a result of this instrumentation, plus the use of a 14,000-gal. rich-oil surge tank interposed between the main absorber and the distillation units, and a 40,000-gal. combined product surge tank interposed between the lean-oil stripping still and the product fractionators, the unit has handled a plant load increase from 5,000 to 17,000 M.c.f. per day over a 3-hour period with no decrease in operating efficiency and with no extra attention from the operators.

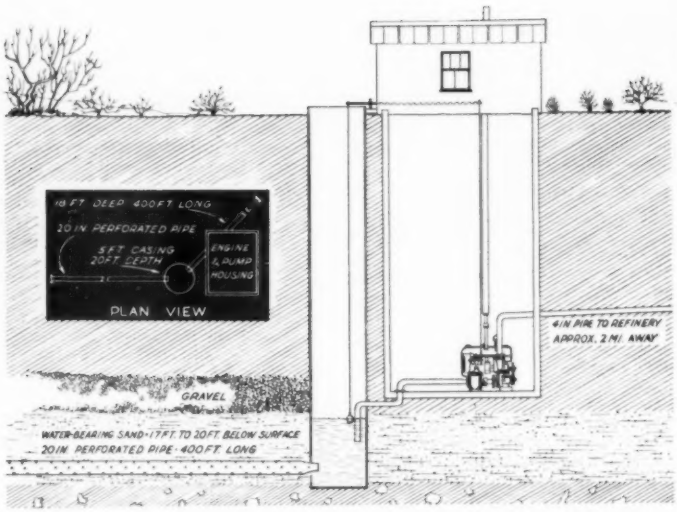
Oil rates to the absorbers are controlled by gas-oil-ratio controllers which not only save on the amount of oil circulated, but tend to give a constant quality of rich oil in the rich-oil surge tank. The rich oil from this tank is charged to the deethanizer by a long-range liquid level controller resetting a flow controller. This arrangement provides a smooth flow of oil to the deethanizer with only gradual changes necessary due to the variations in plant load conditions.

Control Board

A central control board is utilized on which all pertinent instruments for the control of both the new process equipment, and the retained-product fractionating columns, are systematically mounted. This centralization of the entire plant control has proved extremely valuable during starting-up periods, and times of plant upset due to power or other unusual failures. The control room is located between the process pumps and is covered by the same pump shed. This arrangement allows nearly complete operation of the process end of the plant from this shed and is particularly beneficial during inclement weather.

Lean-oil circulation is normally maintained by a centrifugal pump operated by a gas-driven turbine. Approximately half of the lean-gas discharge from the main absorber is expanded through this unit from the 240 psig. absorber discharge to the 70 psig. of the plant fuel system. Approximately 80 hp. is thus recovered when running the plant at its full design load of 20,000 M.c.f. per day of rich-gas intake.

Process design of the new plant addition was furnished by Edward G. Ragatz, with detailed engineering, purchasing, and direction of field work supplied by J. B. Gill Co. of Los Angeles.


18 FT. DEEP 400 FT. LONG
20 IN. PERFORATED PIPE
5 FT. CASING 20 FT. DEPTH
ENGINE & PUMP HOUSING
PLAN VIEW
4 IN. PIPE TO REFINERY APPROX. 2 MI. AWAY
GRAVEL
WATER-BEARING SAND-17 FT. TO 20 FT. BELOW SURFACE
20 IN. PERFORATED PIPE-400 FT. LONG

Plan and vertical cross-section views showing schematic arrangement of horizontal water-well equipment

Horizontal Water Well Supplies 2,500 Bbl. Daily From 3-Ft. Water Sand

LARGE quantities of water from seeping sand have been developed at the Waggoner Refinery, W. T. Waggoner Estate, near Electra, Tex., where a "horizontal" well has drawn 2,500 bbl. a day from a 3-ft. sand formation since 1944. Supt. J. O. Walkup designed the unusual well that year to meet an emergency, as the city of Electra was unable to supply enough water to meet the plant's requirements. Another source had to be established quickly. The well was sunk, and water transferred from there to the refinery through 2 miles of 4-in. pipe by an International U-2 engine on a centrifugal pump.

This 79,000-gal.-per-day supply, augmenting quantities obtained from the city and from three outdoor tanks, made it possible to continue operations through the last year of the war and to date.

Two Long Pipes

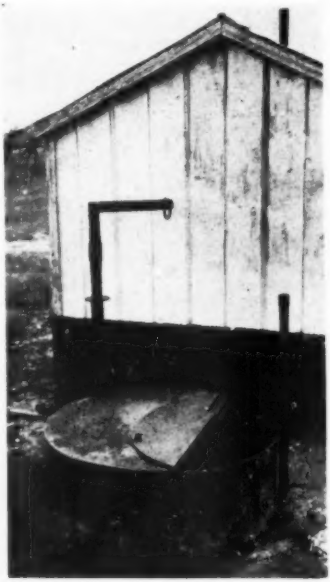
Principal feature is the use of two 400-ft. lengths of 20-in. pipe, imbedded in the water sand 18 ft. beneath the surface. Quarter-inch slots in each pipe, staggered around the circumference and down the length, permit water to seep in from the sand.

Key to the success of the Waggoner well in draining water quickly from the low-pressure water-sand reservoir is the amount of exposed water-gathering surface. A conventional well shaft would contact with the water-sand formation only in a 3-ft. vertical cross-section, extending around the circumference of the shaft.

On the other hand, the horizontal pipes contact with a far greater area of water-bearing sand. Consequently, a larger quantity of water seeps into them than would into an ordinary well shaft. When the pipes were buried, they were covered with scrap sheet metal, then with a 2-ft. layer of gravel, to insure that the slots would not be clogged with dirt.

Water drains from the gathering pipes into a casing 5 ft. in diameter by 20 ft. deep. Pumping through 4 miles of 4-in. line delivers the water to an open tank at the refinery. A shaft, sunk beside the casing, houses the engine and the pump. Operating 24 hours a day, the engine maintains a flow of 50-60 g.p.m. under pressures ranging from 60 to 100 psi.

Pumping rate is regulated by a float control in the casing, which automatically slows the engine when the water level is low, speeds it up when the level rises. Water is lifted vertically approximately 50 ft. over-all on the trip from casing to tank.



Building in background covers engine and centrifugal pump pit. Swing arm at back edge of casing is part of the float control system, which regulates speed of pumping in accordance with level of water in casing. This installation is operating to supply water for operations of the W. T. Waggoner Estate refinery, Electra, Tex.

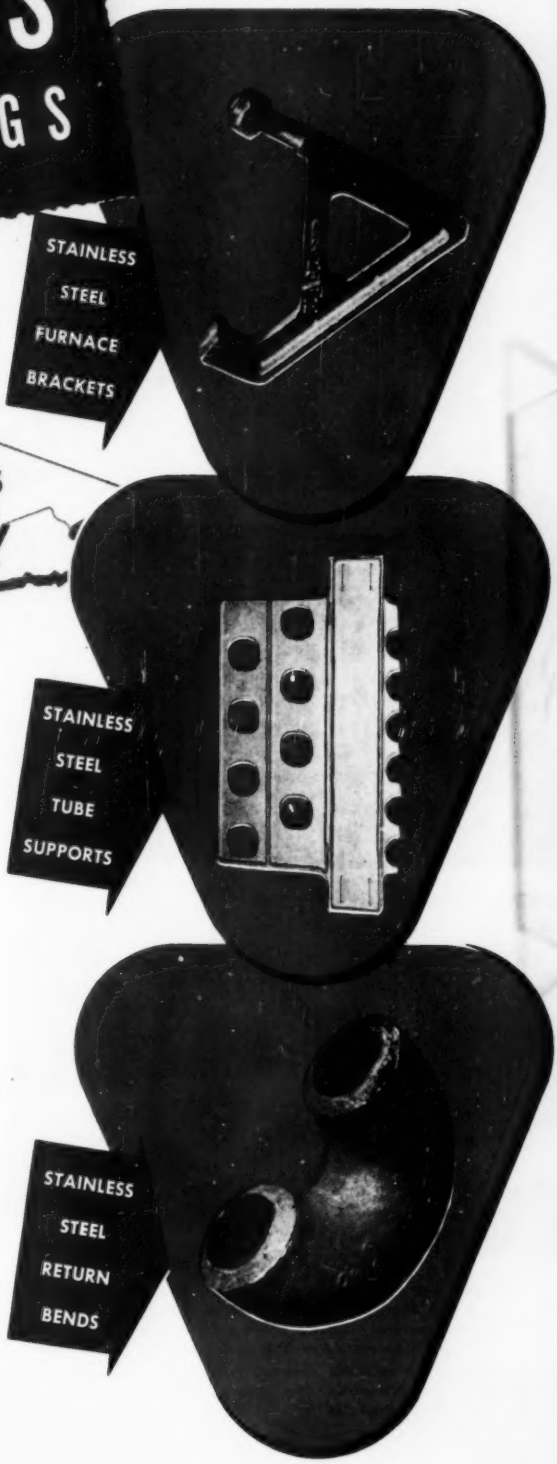
British Oil Industry Stages Exhibition

AN "Exhibition of Oil-Field Development" was a feature of the recent Fourth Empire Mining and Metallurgical Congress at Oxford University, in England. The exhibition was intended by its sponsors to be a chronicle of scientific and technical achievement, its central theme being the supreme importance of oil in the world today and its contribution to modern civilization. It was organized on behalf of the major British crude-oil producing companies.

The exhibition was staged in a new building for Oxford University's department of geology and mineralogy, toward the building of which the Shell interests made a contribution of £25,000. It comprised displays of rocks and sands, with explanatory captions; large maps showing the oil-producing areas of the earth; specimens of the products of petroleum, from fuel oil to insecticides; aerial photographs; geological maps; scientific instruments used in oil exploration, and exhibits of the British oil-equipment industry. More than 3,000 visitors attended the exhibition.

One of the papers presented at the Fourth Empire Mining and Metallurgical Congress has appeared in The Oil and Gas Journal. It was given by H. W. Lane, O.B.E., and discussed various phases of oil activity in the fields of South Iran. The paper was published in three parts, in the issues of August 4, 11, and 18.

STAINLESS STEEL CASTINGS



TESCO PROVIDES *AN IMMEDIATE SUPPLY*

RIGHT IN THE HEART OF THE OIL COUNTRY

These stainless steel refinery castings are typical of the work TESCO is now doing for many manufacturers and operators in the Gulf Coast area. Stainless steel well head castings, valves, chokes and various fittings are other stainless steel pieces produced for oil equipment manufacturers by TESCO.

TESCO is qualified to produce your stainless steel castings for heat and corrosion resistant from a pound to a ton, carefully controlled through constant laboratory analysis exactly to your specifications.

TESCO is right in the middle of the industrial Gulf Coast . . . on the spot to better service the steel casting needs of this area. The TESCO representative and TESCO Metallurgists will be glad to discuss your stainless or carbon steel casting requirements with you.

TEXAS ELECTRIC STEEL CASTING CO.

GOOD CASTINGS — CARBON AND ALLOY STEEL — HOUSTON, TEXAS

A portion of the metal-working - machines section of the research laboratory operated by Gulf at Harmarville, Pa. Equipment employed in the manufacture of special equipment for the laboratory consists of all types of metal-working machinery necessary for the construction of special types of internal-combustion engines on a non-mass-production basis

Center: Hexagonal, square, flat, and round bars; also channels, angles, and tubes in brass, aluminum, and bronze; steel, stainless steel, and plastics make up part of the normal working stock for the machine shop. Screws, bolts, drills, dies, tools, washers, and materials ranging from linen to diamonds are also carried

Above: More than 500 different items including complete sets of machinist's tools, drills, taps, gages, counter sinks, and counter bores are stocked in the tool cage in the foreground

Laboratory Machine Shop

Plays vital role in modern petroleum research programs

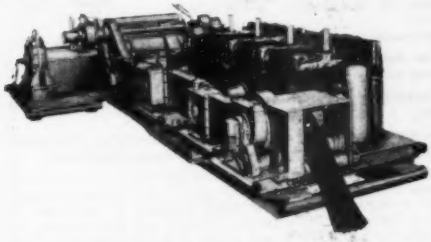
EQUIPMENT in the modern petroleum research laboratory includes many items other than scientific apparatus for studying the different properties of various substances. Frequently apparatus of this type, not commercially available, is developed right in the laboratory for investigating some phase of a special problem. Much of this special apparatus is not only developed by laboratory technicians but it is also manufactured in the laboratory machine shop, an integrated function of the research operation. The equipment employed in the metal-working section of one of the country's large research and exploratory laboratories, maintained by Gulf Oil Corp. at Harmarville, Pa., is shown in the accompanying photographs.

Products of the shop include apparatus for research in all branches of the petroleum industry as well as equipment for field exploratory operations. The airborne magnetometer used in geophysical prospecting, the marsh buggy used in exploration work in swampy regions, to name a couple, are among some of the special items produced in Gulf's laboratory at Harmarville. Tests on cutting and grinding oils are also conducted in the laboratory shop by specialized personnel.

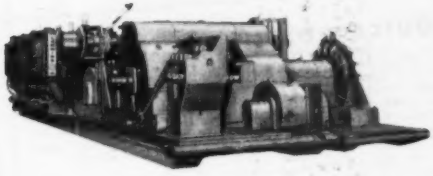
SMOOTHER POWER for TOUGHER DRILLING...

IT'S A Wilson

Wilson Giant Torcair Rig with Cummins "Dual NH" Diesel Engines, owned by George P. Livermore, Inc., running 11 miles southwest of Snyder, Scurry County, Texas.



Wilson Giant Torcair Rig powered by "Dual NH" Cummins Diesel Engines.



★ SENSATIONAL WILSON GIANT TORCAIR RIG AND CUMMINS "DUAL NH" DIESEL HYDRAULIC ENGINES

NOW... Sensational Flexibility! Money-Saving Efficiency! "Cushioned" Power!... With this new POWER TEAM! The WILSON Giant Torcair Rig powered by the "Dual NH" Cummins Diesel Hydraulic Power Unit! The WILSON Giant Torcair, equipped with Wilson Air-Tube Disc Drum Clutches, is COMPLETELY AIR CONTROLLED! Torque Converter Drives on 1, 2, or 3 engines... Full Vision Panel Control... Full Circulating Water-Cooled Brakes. The Cummins Diesel, equipped with Air Clutches and Hydraulic Couplings, is another step in the long battle to make internal combustion engines more FLEXIBLE for oil field operation.

This team is the answer to SMOOTHER power for TOUGHER drilling!

Write for WILSON BULLETIN 172.

FOR THE FIRST TIME! Flexibly teamed engines successfully combined with world-famous WILSON RIGS equipped with Air-Tube Disc Drum Clutches and Air Controls!

COMPARE PRICES BEFORE YOU BUY!

Wilson

MANUFACTURING CO., INC.
WICHITA FALLS
TEXAS

Baash-Ross News

BAASH-ROSS TOOL COMPANY • LOS ANGELES • HOUSTON • OKLAHOMA CITY • NEW YORK

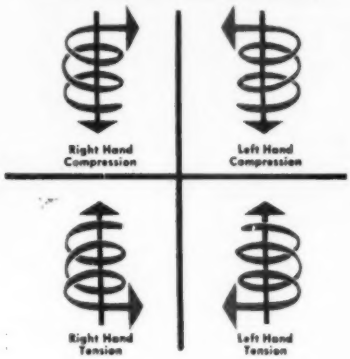
OUR 29th YEAR

ANOTHER NEW BAASH-ROSS PRODUCT!

A simple, positive way to REMOVE STUCK TUBING STRINGS FROM YOUR PRODUCING WELLS

BAASH-ROSS PRODUCTION SAFETY JOINTS

4 TYPES TO MEET EVERY PRODUCTION REQUIREMENT



Why run the risk of costly salvage operations every time stuck packers, sanding conditions or similar difficulties jeopardize recovery of your tubing string, when it costs so little to insure recovery by using Baash-Ross Production Safety Joints?

A Baash-Ross Production Safety Joint placed in your tubing string provides a positive means of freeing the string at the point where the Safety Joint is installed, thus permitting important savings to be made in production operations. For example . . .

- **Where production packers are used, a Safety Joint should be installed above the packer to permit positive and complete release of the tubing string should the packer become stuck.**
- **Where sanding conditions exist, one or more Baash-Ross Production Safety Joints should be installed in the tubing string to permit selective release and maximum recovery.**
- **Where it may be desirable to change production methods in a well, a Baash-Ross Production Safety Joint should be installed in the tubing string to permit such changes to be made quickly and easily without disturbing the packer.**

Baash-Ross Production Safety Joints are simple in design, positive in operation and low in cost. They are provided with a unique locking lug that permits heavy rotational loads to be transmitted through the Joint without loosening it—yet disengagement can be quickly made whenever desired by merely following a simple sequence of operations. A choice of *four* different releasing actions is available—either *left* or *right* hand rotation, combined with either *raising* or *lowering* the production string—thus providing the exact releasing action best suited to each production hook-up.

LEAK-PROOF SEAL . . . FULL OPENING PASSAGE

[illegible] in the illustration here the Baash-Ross Production Safety Joint is packed off top and bottom with self-sealing "O" rings to permit circulation through the Joint without leakage. Also, the Joint is full-opening so that tools and shots and equipment can be passed without restriction. Finally, the Joint has the same internal and outside diameters as [illegible] Safety Joint—everything that will pass through the tubing string will pass through the Joint . . . and the Joint itself will pass through casing the tubing couplings will pass through[illegible] clearance when used with certain types of equipment.

A Size For Every Production Need

Baash-Ross Production Safety Joints are made of heat-treated alloy steel and are available in all four releasing actions in all sizes and types of API Tubing. So no matter what the nature of your particular production problem, you can protect against tubing [illegible] or succession operations by placing BOS all three efficient Joints on every tubing string.

QUICK POSITIVE RELEASE

Here's how the Baash-Ross Production Safety Joint operates to protect your tubing strings. The Joint consists essentially of a box and pin releasing thread (either right or left hand, as ordered) that is packed off top and bottom with self-sealing "O" rings. In the upper portion of the pin thread, two vertical lugs are machined into the body, and these lugs mate with a corresponding lug machined into the box portion.

The releasing threads are cut with a loose fit—that is, when the Joint is made up, the two portions can move a short distance longitudinally with respect to one another without affecting the vertical alignment of the Joint. This movement permits the mating lugs to lock and unlock as one portion of the Joint is moved with respect to the other portion—and the design of the lugs determines whether the Joint unlocks in tension or in compression. A shear pin is also provided that permits longitudinal movement of the Joint, but prevents premature rotational release.

Basically, the releasing action consists of first unlocking the lugs by lowering (or raising) the string—then rotating the string in the proper releasing direction (either right or left) to sever the shear pin and unscrew the Joint. Only by first moving the string in the proper vertical direction, then rotating it in the correct releasing direction, can the Joint be disengaged—and by properly selecting the releasing action, other tools below can be set and released without risk of disengaging the Joint.

Eight separate pays plus 2,200 ft. of producing closure give Lost Soldier field

by Roy F. Carlson
District Editor

Highest Barrel-per-Acre Recovery In the Rocky Mountain Area

AT least eight separate and distinct pays, drilled during 33 years of development work, plus more than 2,200 ft. of producing closure give Lost Soldier field in northeastern Sweetwater County, Wyoming, the highest barrel-per-acre recovery in the Rocky Mountain area. Calculated on the acreage of some of the shallower producing sands, the field has thus far produced about 60,000 bbl. of oil per acre, or a total of 39,267,000 bbl. Another factor in the high recovery that has been effected is a water drive which is apparently active in most of the pay zones. Some estimates of future recoverable oil in the field amount to as much as 150,000,000 bbl.

Pumping equipment has been installed on only about 50 per cent of the wells in the field, since a gas-lift program was placed in operation nearly a quarter-century ago, and is still functioning. Adding to the variety of operations in the field is a pressure-maintenance program for the Tensleep sand, and a small gasoline plant as incidental operation.

Oil in Lost Soldier field has accumulated in an asymmetrical elliptical fold which, at the Tensleep sand horizon, has a maximum length of about 12,200 ft. and a maximum width of about 5,000 ft. The axis of the structure trends in a northwesterly direction. Lost Soldier is the most westerly of a series of fields paralleling the Seminole fault zone.

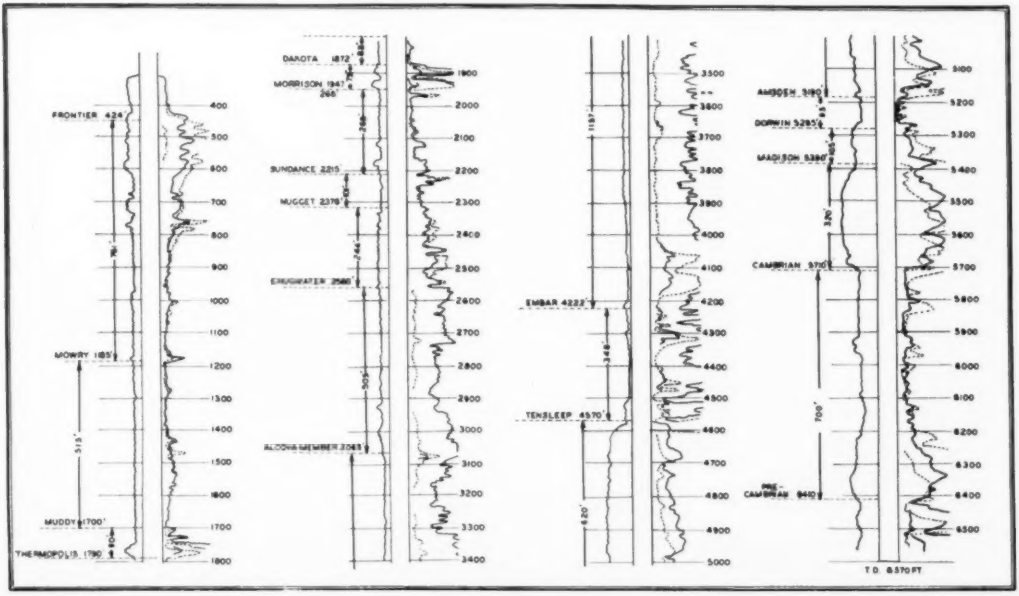
The surface formation in the field is the Niobrara shale of Upper Cretaceous age, and a normal Rocky Mountain geologic column is encountered from the surface to granite. Many of that area's producing horizons are encountered in the field, and examples of nearly all formations appearing in Rocky Mountain stratigraphy are present in the field. As shown by the stratigraphic column, formations found in the field are of Cretaceous, Jurassic, Triassic, Permian, Pennsylvanian, Mississippian, and Cambrian age.

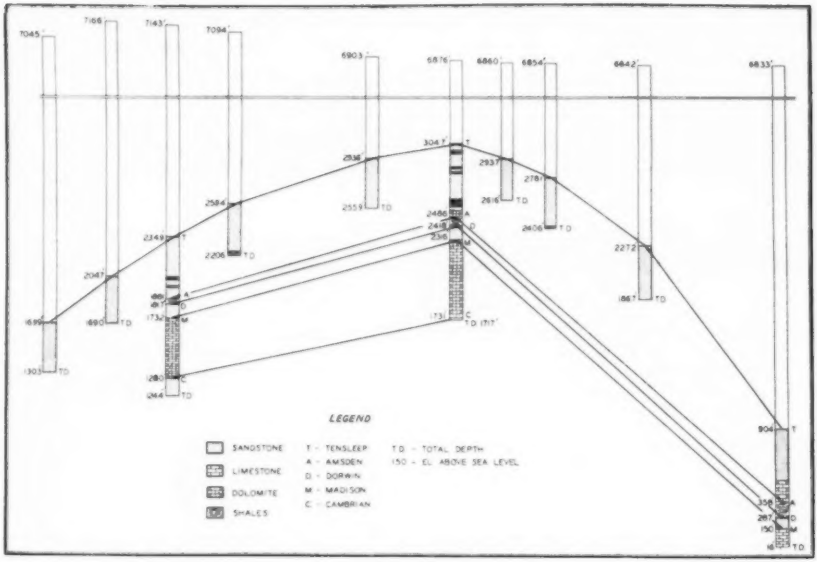
Oil produced from the four highest formations, including the Sundance, is sweet, of high gravity, and contains no sulfur. Oil from the Tensleep and deeper horizons is of lower gravity and contains sulfur in varying quantities. Tensleep oil is of 34° gravity and has a sulfur content of 1.2 per cent. Because of the sulfur content, little of the Tensleep crude was produced until 1941 when improved refining facilities and demand for crude made production profitable and necessary.

Producing Formations

Oldest production in the field is from the Wall Creek sands, discovered in this field in 1916. These sands, of Cretaceous age, are found in the Frontier formation, and are distributed widely throughout the Rocky

Electric log of well in Lost Soldier field. Most of the formations typical of Rocky Mountain geology are present here





Left: Longitudinal cross-section of the Lost Soldier dome, formation tops taken in wells intersected by the line shown in the map below. Neither of the Cambrian producing wells is included in the drawing

Below: Subsurface contours drawn on top of the Tensleep sand, most prolific of the Lost Soldier pays. Note the extremely large degree of closure for the small surface area involved

Mountain area. The first of the sands is found at a depth of 265 ft.—an aggregate Wall Creek sand thickness of 200 ft. being found in Lost Soldier field. Cumulative production to date from this formation is about 5,000,000 bbl.

Newest production, causing widespread interest in the Rocky Mountain region, is from the Cambrian conglomerate, found here at a depth of 5,254 ft. and now known as the Deadwood formation. Two wells have been drilled to the Cambrian and are now producing at an average rate of 1,750 bbl. per day, production being augmented with gas lift. The first well was completed in June 1948 and development work in this pay is still being carried on.

The eight producing formations besides the Frontier and Cambrian mentioned above include Dakota, Lakota, Morrison, Sundance, Tensleep, and Madison. In addition, one other formation is known to contain oil, and is producing in other areas in Wyoming. This is the basal Amsden, here sometimes called the Dorwin formation, which produces oil commercially at nearby Wertz dome.

Production in the Dakota, also of upper Cretaceous age, was discovered in August 1920, at depths ranging from 1,345 to 2,050 ft. Average thickness of this formation is about 55 ft. Extent of the formation has been tested with 22 wells, only 2 of which are now producing, production being 85 bbl. of oil per day with 25 bbl. of water.

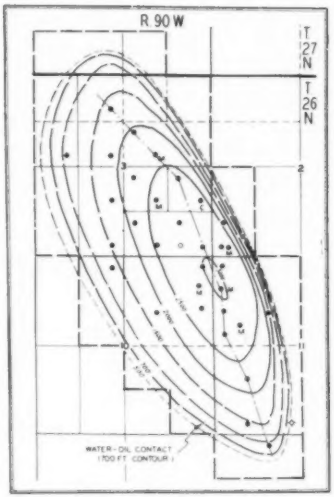
The next pay zone below the Dakota is the Lakota, production from which was discovered in May 1922. Nineteen tests were drilled, to depths ranging from 1,510 to 2,100 ft. One of these is producing at the present time at a rate of 10 bbl. of oil and 1 bbl. of water. Cumulative production from the Lakota and Dakota equals nearly 7,000,000 bbl.

The Jurassic Morrison formation is found below the Lakota at a depth of about 1,950 ft. Production from this formation is of minor importance. One well is now producing 100 bbl. of oil daily with 45 bbl. of water. Production here was discovered in 1926.

The fifth pay zone in the geologic column is the Sundance of Jurassic age, one of the most prolific of all the formations in the field. It was discovered in 1926 and tested with 31 wells which encountered the formation at from 1,800 to 2,350 ft. On June 1, 1949, it had produced nearly 9,000,000 bbl. of oil, and is now producing 314 bbl. from 16 wells. Daily water production is now about 2,473 bbl. Average sand thickness is about 225 ft.

The sixth and most important single pay zone in the field is in the Tensleep formation of Pennsylvanian age, discovered in 1930. Total production to June 1949 from this formation was approximately 16,000,000 bbl., with a daily average of 2,500 bbl. of oil and 140 bbl. of water now being produced. It is this zone which is now subject to a pressure-maintenance operation, with one injection well being in operation. Twenty-four wells are producing from this formation.

The top portion of the Tensleep has an average porosity of 15 per cent and a permeability range of from 50 to 150 md. while the lower part has an average porosity of 10 per cent and a range of permeability



of 0 to 125 md. Average thickness is about 360 ft.

When first drilled the Tensleep was undersaturated with gas, since the oil had a saturation pressure of 900 psi. while reservoir pressure was in excess of 2,000 psi. Initial production from the first well drilled to the Tensleep was 1,750 bbl. per day.

One of the newest of the pays in this field is the Madison formation with a cumulative production on June 1 of approximately 1,575,000 bbl. The first well in this formation was completed in January 1948. Daily average production from the pay is 4,200 bbl. The discovery well was

(Continued on page 136)

READ WHAT ONE TOOL PUSHER SAYS ABOUT THE

EMPIRE *Metering* MUD MIXER

Picture shows actual set up of Empire Metering Mud Mixer being used on Chancellor well No. 1 in the Benedum field, brought in at 11525 feet. M. E. Self is the Tool Pusher.

HELMERICH & PAYNE, INC.
619 PHILTOWER
TULSA, OKLAHOMA

July 28, 1949

Mr. D. F. Payte, General Manager
Empire Machinery Company, Ltd.
P. O. Box 4026
Odessa, Texas

Dear Mr. Payte:

We believe that the records of three wells recently drilled will assure Oil Companies a saving in their mud costs by using Empire Mud Mixers.

In this three well test, all in the same field, the first well was drilled without the use of the Empire Mud Mixer. The mud cost was approximately $26,000.00. The second and third wells were drilled using the Mud Mixer. The mud costs were $9,560.00 and $8,700.00 respectively. This saving was for the Oil Company, our saving was in man hours.

Our crews like to use the Mud Mixer. It is constructed to make their jobs easier.

Should you desire more information on this project, please let us be of service to you.

Yours very truly,

HELMERICH & PAYNE, INC.

M. E. Self

M. E. Self
Tool Pusher

MES:rc

HOW TO SAVE MUD COSTS IN ONE SIMPLE LESSON

It is a lesson worth remembering. Drilling Contractors are finding that when they save the Oil Companies so much by using the Empire Metering Mud Mixer, it is easier to get the next Contract. The Drilling Contractors are finding that they also make a savings, in man hours.

Descriptive literature has been prepared and is available by simply writing to Empire. If you live in the Odessa, Tulsa or Abilene territory a man from our office will be glad to call on you.

EMPIRE MACHINERY CO. LTD.
BOX 4026 ODESSA, TEXAS PHONE 9161

SALES OFFICES IN TULSA, OKLAHOMA AND ABILENE, TEXAS
804 NEIL P. ANDERSON BLDG., PHONE 2-6349, FT. WORTH, TEXAS

Drill wells FASTER AND STRAIGHTER with REED ROCK BITS

"2H"

For the hard, dense limestones and abrasive or non-abrasive limestones and sands.

Reed ROLLER BIT COMPANY

HOUSTON 1, TEXAS

BE SAFE WITH REED

GAS-TURBINE-DRIVEN PUMPING UNIT

For natural-gas transmission line has been installed experimentally to test feasibility for such service

THE first experimental gas-turbine gas-line pump has been installed temporarily at Wilmar, Ark., to test the feasibility of a unit of this type in transportation of natural gas. This location was selected since it provided the necessary flexibility allowing tests to be made covering the entire operating range of the gas turbine unit. Wilmar is approximately midway between the Crossett and the Glendate stations of Mississippi River Fuel Corp.'s 22-in. pipe line connecting Monroe, La., with St. Louis.

The experimental 2,000-hp. gas-turbine unit which has been on test at the Westinghouse South Philadelphia Works since September 1946 is being used at Wilmar. Shop tests at South Philadelphia Works have thoroughly established the component efficiencies, fuel rates, and operating characteristics. The unit was modified by replacing the reduction gear and d.c. generators, used for shop testing, with a direct-connected centrifugal-type gas booster. This commercial application should establish the life of the high-temperature parts.

The pumping unit consists of a straight-through simple open-cycle gas turbine direct connected to a centrifugal-type gas booster. The complete unit, with all auxiliaries, is mounted on a single bedplate and is 20 ft. long, 5 ft. wide, 4½ ft. high, and weighing 26,000 lb. The fabricated bedplate is sufficiently rigid to maintain alignment of the high-speed rotating parts making separate rigid foundations unnecessary and allowing the unit to be assembled at the factory and shipped as a complete package. The unit is rated at 1,850 hp. output to the gas booster based on inlet air conditions of 14.7 psia. and 100° F. temperature. An outline of the unit is shown in drawing, Fig. 1.

A longitudinal section of the working elements of the gas turbine power unit is shown in Fig. 2. Free air enters the compressor at the left (Fig. 2), is compressed to approximately five atmospheres, passes into 12 tubular-type combustors where fuel is injected and burned, and then the heated air and products of combustion are expanded through the turbine, and exhausted to the atmosphere. About two-thirds of the turbine output is consumed by the compressor, the remainder being available to drive the gas booster. A small reduction gear, driven from the main shaft, is used for starting the turbine and driving auxiliaries. The 8,750-r.p.m. turbine-compressor shaft is direct connected to the gas booster.

Compressor and Combustors

Of the axial-flow type the air compressor for the gas turbine is designed to pass 28,000 cu. ft. per minute of air at a pressure ratio of 5 to 1 at full-load conditions. The compressor contains 23 stages of nonsymmetric blading designed so that the major pressure rise occurs in the rotating blades. Rotating blades, unshrouded and profiled at the tips, are forged from 15 per cent chromium steel. The blades are machined with serrated-type roots which are caulked into machining grooves in the rotor. Stationary blades are rolled to shape and welded to shrouding to form a lightweight diaphragm construction.

The compressor rotor is a solid carbon-steel forging and the compressor cylinder is made of welded steel plate. Compressor and turbine are direct and solidly connected by a jack shaft and any unbalance of thrust between the turbine and the compressor is taken by a segmental-type thrust bearing at the discharge end of the compressor.

There are 12 combustors 6 in. in diameter and 3 ft. long located between the compressor and the turbine so as to provide a minimum of turning of the high-velocity gases. Each combustor is interconnected for ignition purposes. Combustor casings are made of carbon-steel pipe with a bellows-type expansion joint welded to the turbine end. They are clamped in place at each end by tapered flanges.

The flame tube, or inner basket, is made of chromium-nickel alloy sheet rolled into circular sections and spot welded together. When in operation, the flame is contained within this inner tube which is perforated to allow air to enter for combustion and necessary cooling.

Nozzle holders are of the bayonet type which can be extracted individually without removal of a combustor. The holders and combustors are designed to use either gas or oil as fuel. Transfers from one fuel to the other can be accomplished quickly by removing the nozzle holders and changing the nozzles without disturbing the combustors. To maintain high combustion efficiency over the entire load range, when burning liquid fuel, a small amount of natural gas is used for atomization.

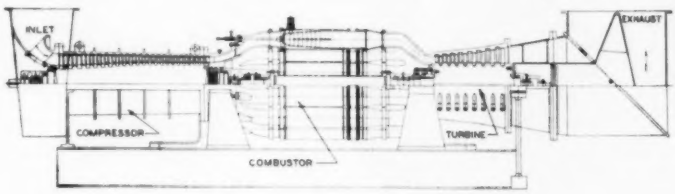


Fig. 2—Cross-section of gas-turbine unit

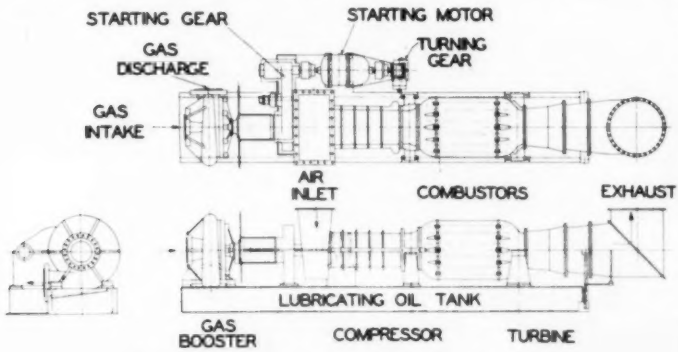


Fig. 1—Outline drawing of gas-turbine gas-line pumping unit

The Turbine

The eight stages of the gas turbine are designed for equal heat drops over the stationary and rotating blades. The shaft seals used are of the labyrinth type with no parts rubbing

GREATER STRENGTH

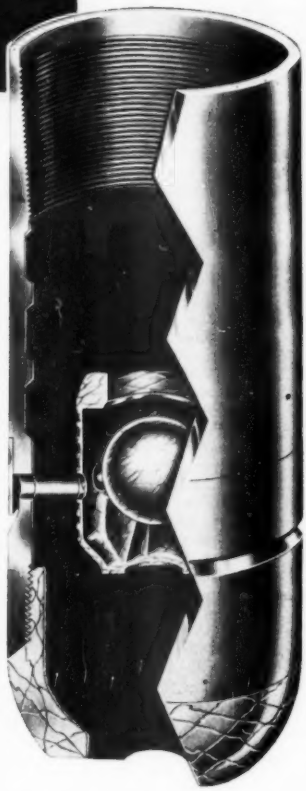
in this LARKIN VALVE ASSEMBLY *adds* SAFETY *to your* CEMENT STRINGS

Landing and cementing casing in deep wells today has become one of the most critical operations in completion work.

Larkin, appreciating its obligations *for the success* of these operations, has built extra strength into Larkin Floating and Guiding Equipment to add safety to your longest cement strings.

The Larkin Valve Assembly is positive in action and provides an immediate seal against the slightest reversal of pressure. Extra strength makes it strong enough to withstand any differential pressure developed between the outside and inside of the casing string.

The ball type valve assembly is designed and constructed to prevent the ball from washing out or being otherwise injured under the impact of drilling fluid or cement slurry. The entire Larkin valve mechanism is constructed of reinforced Bakelite . . . easy to drill and circulate from the well.



The extra strength throughout the above Larkin Valve Assembly brings safety to your cement job . . . contributes to successful cementing. Buy it through your supply store.

LARKIN

...Through Your Supply Store

LARKIN PACKER CO., Inc.

ST. LOUIS, MO.

the rotating shaft. The bearings are of the pressure-lubricated journal type conforming to established steam-turbine practice.

All of the turbine blading is made of cobolt-chromium tungsten alloy by the precision casting method. Rotating blades are tapered and twisted and have a serrated root machined on the base. Stationary blades have a single T-type fastening which is held in place by caulking. All blading is unshrouded and is profiled at the tip. The rotor is machined from a solid forging of stabilized 19-9 stainless steel, the main section being 14½ in. in diameter and 24 in. long.

The cylinder is made of stabilized 19-9 stainless steel, grooved for holding the stationary blading. All bolting is made of stainless-steel material. Alignment in the turbine is maintained by using suitable mechanical hinges arranged to permit thermal expansion.

The starting motor is a 40-hp., 440-volt, double-extended-shaft, wound-rotor, induction motor controlled by a drum-type controller and resistors. The motor driving the main unit through the starting gear train is capable of rotating the unit at 25 per cent speed. After the starting cycle, the starting motor is disengaged by a disengaging coupling. On the extended end of the motor shaft is connected a turning gear for rotating the unit at approximately 10 r.p.m. after shutdown to prevent thermal distortion of the rotating elements.

With exception of the oil cooler, the entire lubricating oil system is contained within the bedplate. The structural steel frame of the bedplate constitutes the oil reservoir and the piping and auxiliaries are mounted along the side. A 2-hp. auxiliary motor-driven pump supplies lubricating oil for starting and a direct-connected pump, driven by the main idler gear, supplies the lubricating oil when running. A pressure switch shuts off the auxiliary lubricating-oil pump automatically as the main lubricating-oil pump takes over.

Of the "oil to air" radiator type the oil cooler is mounted outside of the building. A motor-driven fan automatically controlled by a thermostat switch in the bearing oil supply line supplies the cooling air. This arrangement eliminates the need for any cooling water.

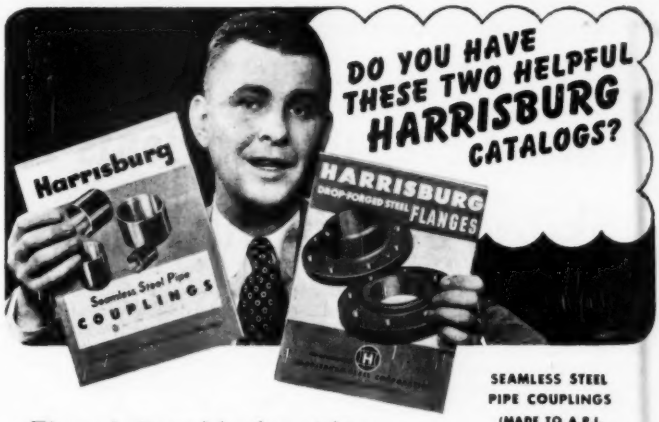
Gas Booster

The Ingersoll-Rand gas booster is direct connected through a quill-shaft and gear-tooth coupling to the compressor end of the gas-turbine unit. The booster is a single-stage centrifugal blower with the impeller overhung on the bearings.

Booster casing is cast steel, made in two pieces, so that the entire rotor, bearings, and shaft seal is removable with the booster backplate. With this construction it is possible to remove and inspect all parts of the booster without opening any gas-piping flanges. Backplate and rotor assembly can be taken out through a hole in the firewall, after first removing the coupling housing and quill shaft connecting the booster to the air compressor.

The rotor shaft is supported in two sleeve bearings with a Kingsbury thrust bearing between the two sleeve bearings. This bearing takes the thrust load from the high pressure on the end of the shaft combined with the thrust developed by the impeller at running speed. Between the sleeve bearing and impeller there is an oil seal supplied with oil at a pressure higher than the gas pressure in the casing. This prevents any gas from leaking out of the casing at the shaft.

In the lubrication and seal-oil system one pump supplies oil to the bearings and a second high-pressure pump supplies oil to an overhead tank. Oil for the seal oil is supplied from this overhead tank. In the event of pump failure, the overhead tank is pressurized with gas so as to provide sufficient seal oil until the unit is shut down and all gas valves secured. The oil is cooled by a radiator-type cooler having a ½-hp. fan for air circulation, automatically controlled by a thermostat in the oil line.

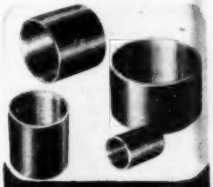


If you don't, send for them right now, while you're thinking about it. They are free—no obligation—and we believe you will find them helpful and informative.

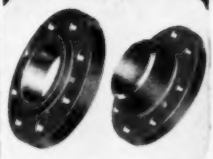
They're chock-full of practical selection tables, charts, and technical information on Harrisburg Seamless Steel Pipe Couplings and Drop-Forged Steel Pipe Flanges.

We think everyone interested in these two important items of oil field equipment should have these catalogs on file. Use the coupon, or write us a postcard or letter.

SEAMLESS STEEL PIPE COUPLINGS (MADE TO A.P.I. SPECIFICATIONS)



FIRST BECAUSE THEY'RE FINEST



DROP-FORGED STEEL PIPE FLANGES (MANUFACTURED TO A.S.A. STANDARDS)

SEND THE HARRISBURG CATALOG CHECKED
Harrisburg Steel Corporation, Harrisburg 6, Penna.

( ) Harrisburg Seamless Steel Pipe Couplings.
( ) Harrisburg Drop-Forged Steel Pipe Flanges.

Name .....
Company .....
Address .....
City ..... Zone ..... State .....

Harrisburg STEEL CORPORATION
HARRISBURG 6, PENNSYLVANIA

96 YEARS IN PENNSYLVANIA'S CAPITAL

Part of one of the early classes at Orange Coast College on an in-the-field training trip, pictured here in front of a pulling unit. Instructor John O. Nigra is in the front row at right

Course Prepares Students for Skilled Jobs in Oil Industry

ORANGE COAST COLLEGE, near Costa Mesa, Calif., is the latest addition to the rather small list of schools that offer a course preparing students for skilled or subprofessional jobs in the oil industry. Other than schools which offer the complete 4-year university program, there are, at present, five schools that provide formal training in drilling practice, production methods, and refinery techniques.

Four of these schools are in California. They are at Long Beach, Bakersfield, Coalinga, and now Orange Coast College. The fifth school is at Kilgore, Tex.

This school opened in September 1948. It is a public junior college, established by vote of the people in the district served, and includes the Newport Harbor and Huntington Beach Union High School districts.

Orange Coast College is located on part of the former Santa Ana Army Air Base about 1½ miles north of Costa Mesa. Through War Assets Administration, the college received 342 acres of land and 67 buildings. These include dormitories, classroom buildings, auditorium, chapel, cafeteria, and recreation hall.

The course offered requires 2 years to complete, and is a full-time course. At the end of the course successful students receive an associate in arts degree in petroleum technology.

The curriculum has been established with the advice and cooperation of employers and workers in the oil fields. It is designed to provide preliminary training in various aspects of petroleum development and production. While scientific background and related information is included in the technology course, the major emphasis is on oil-field operations with actual in-the-field training.

The first year is a basic year for all students planning to enter the petroleum industry. The second year is designed for petroleum majors who desire training in development and exploration.

The course consists of theory and practice in prospecting, drilling, and production of petroleum. The course includes lectures, laboratory, and field trips, together with the necessary science, mathematics, and mechanical skills required. The program can be varied to provide training for positions in office work and marketing, or in construction and maintenance.

The first petroleum technology class has a starting group of 15 students. About 70 per cent are veterans formerly employed in oil work.

The head of the petroleum technology department is John O. Nigra, an A.B. graduate of University of Texas college of mines, who received his master's degree in geological science from California Institute of Technology.

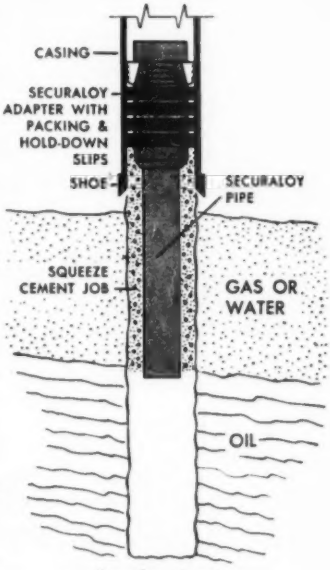
As in all California junior colleges there is no tuition fee at Orange Coast College. The only charge is a membership fee of $7.50, paid each semester. Certain residence restrictions must be met to attend the school. Otherwise applications for admission must be approved by the president of the college.

USE OF SECURALOY SOLVES MANY PRODUCTION PROBLEMS

Securaloy pipe, which may be removed with chemicals or a drilling bit, is being used to solve many "difficult" production problems, such as correcting gas-oil ratios, water shutoffs and plug backs.

CORRECTING GAS-OIL RATIOS

This method is similar to that used in the case history shown on the opposite page except that the Securaloy pipe extends through the gas zone to the top of the oil zone.



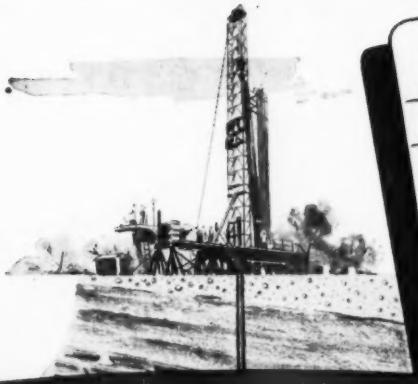
Securaloy set on top of producing zone

This method is used where the entire oil zone can be produced from open hole and where it is not necessary to confine the oil production to selective strata. The hole through the oil zone is first filled with gravel. Securaloy pipe is run and squeeze cemented in position. When the cement has set, Securaloy cementing shoe and gravel are cleaned out and well is ready for production, with gas or water successfully under control.

SECURITY ENGINEERING CO., INC.

ONE OF THE DRESSER INDUSTRIES

Main Office and Plant: Whittier, California
Branches in all of the major producing areas
Export Office: Chanin Building, New York City



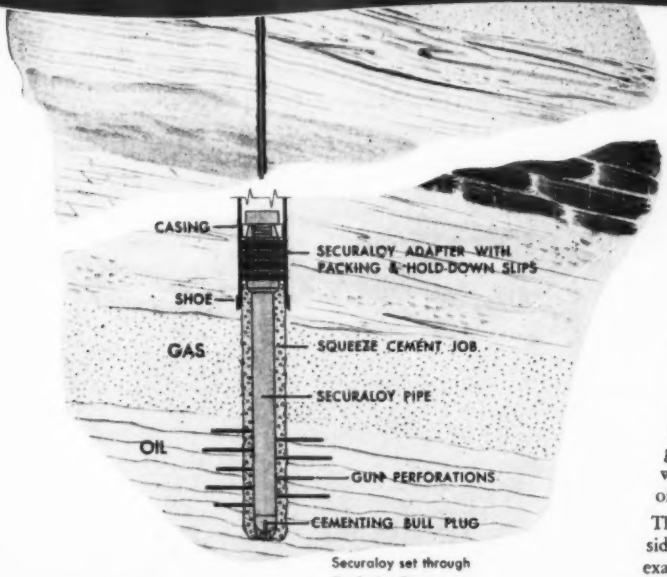
LOCATION: Texas

GAS-OIL RATIO: 300 to 1

PRODUCTION: 5-6 barrels per day on pump

QUESTION: How to increase production and lower gas-oil ratio by a simple and satisfactory remedial method

Too much gas—Too little oil?



Securaloy set through Producing Zone

When a Texas operator found his gas-oil ratio too high and production way down he determined that the positive way to correct this situation was to use Securaloy. You, too, can profit by using Securaloy to solve your gas-oil ratio problems.

This operator first tried a plastic squeeze job, but the well still made only 6 barrels per day. Then a cement squeeze job was performed, with the entire open hole left full of cement and then drilled out. This proved unsuccessful too!

Finally, the operator cemented Securaloy pipe through the gas-oil sands, as shown. Selective strata were gun perforated and acidized. The well was then completed for 80 barrels of oil per day with a 40 to 1 gas-oil ratio!

This same remedial method is now considered standard practice . . . Another example of the application of Securaloy to solve your production problems.

Security

ROCK BITS • CORING BITS • HOLE OPENERS • REAMERS • CASING SCRAPERS

Securaloy

PRODUCTION EQUIPMENT

SECURITY ENGINEERING CO., INC.

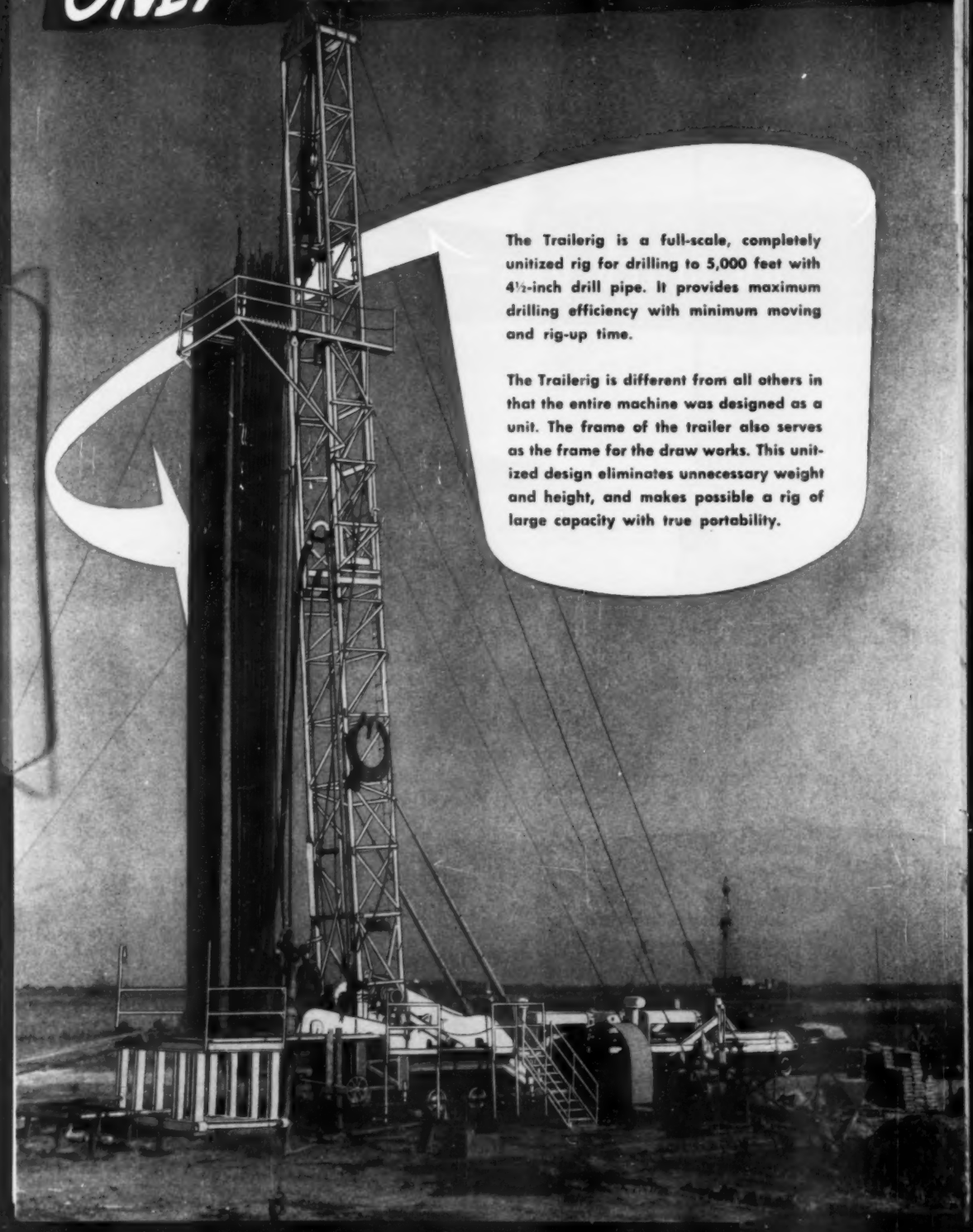
ONE OF THE DRESSER INDUSTRIES

Main Office and Plant: Whittier, California

Branches in all of the major producing areas

Export Office: Chanin Building, New York City

ONLY "CARDWELL" TRAILERIG

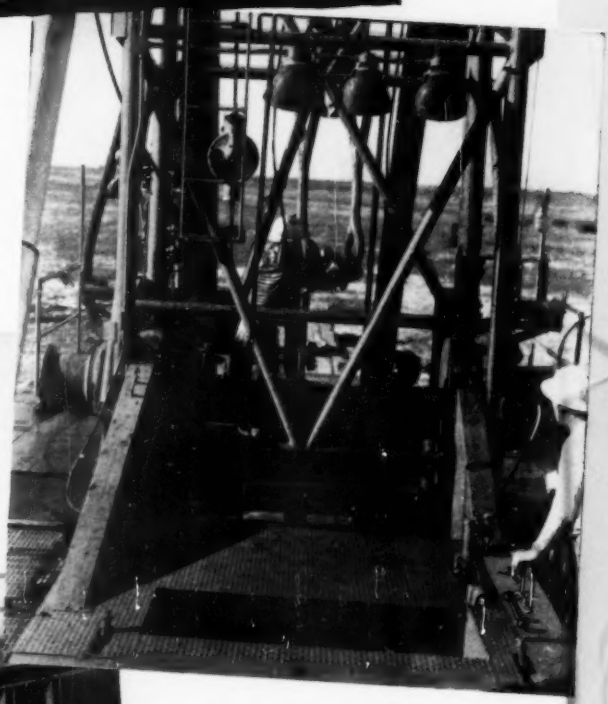


The Trailerig is a full-scale, completely unitized rig for drilling to 5,000 feet with 4½-inch drill pipe. It provides maximum drilling efficiency with minimum moving and rig-up time.

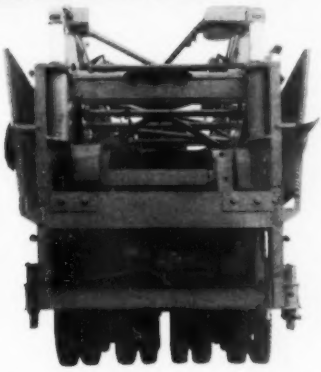
The Trailerig is different from all others in that the entire machine was designed as a unit. The frame of the trailer also serves as the frame for the draw works. This unitized design eliminates unnecessary weight and height, and makes possible a rig of large capacity with true portability.

has all these features!

Clear vision and real safety for the driller is a feature of the Trailerig. The driller stands behind the cathead and has a good view of the table and racking platform. Finger-tip air controls give the driller effortless and positive control of all draw works operations.



The 16-foot square working platform, all in the clear, gives the crew a lot of space to work in safety and comfort. The built-in rathole digger saves time on every well.



The Trailerig is only 8 feet wide, 13½ feet high and 59 feet long. This highly portable rig is carried on 16 tires mounted on articulated axles to provide even distribution of weight on all tires. Athey tracks are available for extreme conditions.

Ample space under the rotary table is of vital importance on drilling and workover jobs. The Trailerig has 64 inches to the bottom of the support beams, and 10 additional inches to the bottom of the rotary table. This provides enough space for blowout preventers and wellhead connections. The well is readily accessible from either side.

CARDWELL

REG. U. S. TRADE MARK PAT. OFFICE

THIS TRADE MARK INSURES HIGHEST QUALITY AT LOWEST PRICE

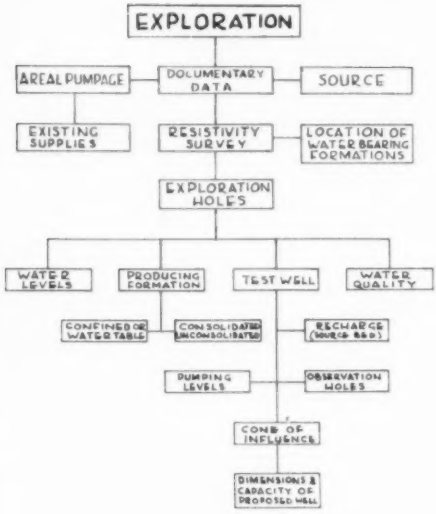
CARDWELL MFG. CO. INC.

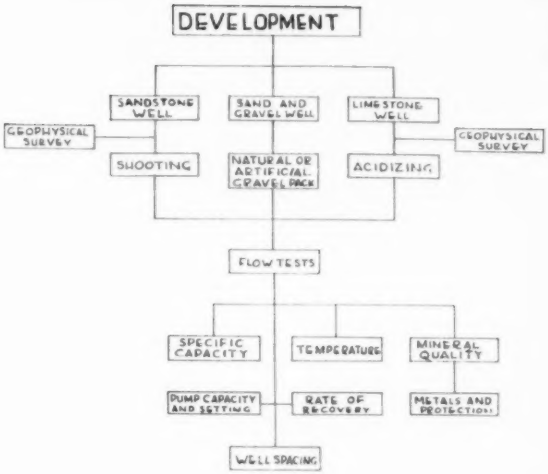
P. O. Drawer 2001 . . . Long Distance Telephones 128—129—130

Cable Address: "ALL STEEL," Wichita—"CARDSTEEL," New York

Wichita, Kansas, U.S.A.

WHEN IT'S A "CARDWELL," THERE'S NO EQUAL IN QUALITY



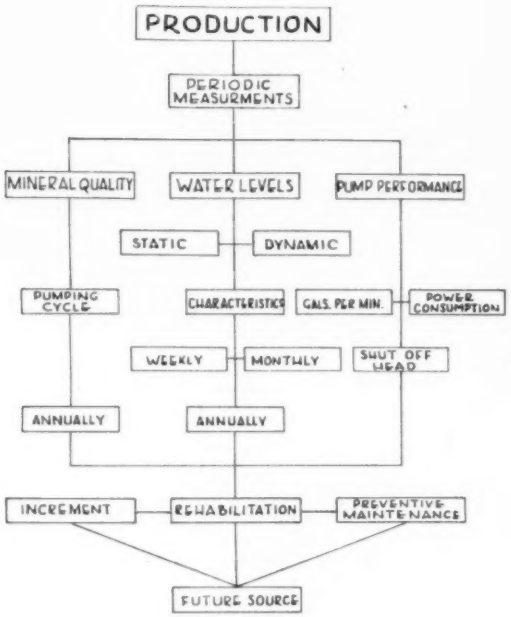


GUIDE CHARTS

In Development of

GROUND-WATER SUPPLIES

by John B. Millis*



SUBSURFACE water occupying zone of saturation or, in a strict sense, water below the water table is known as ground water. Procedure for development of new ground water supplies divides into three basic steps:

1. Exploring the possibilities of this natural resource is a determination of availability in a specific area.

2. Development places a given value on the producing formation.

3. Production, to be successful, should be one of maintenance, demanding thoughtful observation through record to eliminate pumpage or withdrawal beyond the ability of the producing formation.

Diagrammatically, these three major steps are herein indicated on the accompanying charts.

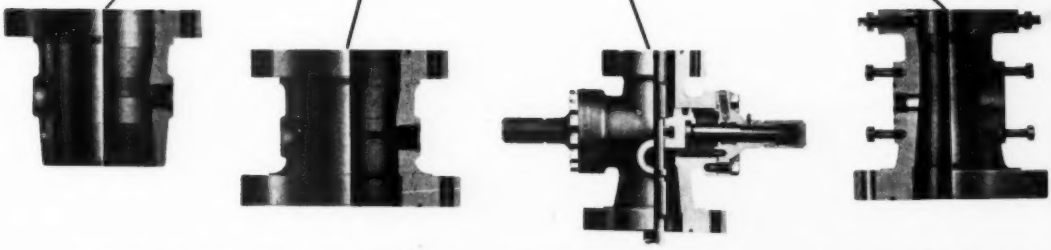
Few areas are documented as to preclude any further studies or investigations when increment is demanded or a new plant site is contemplated requiring a ground-water supply. Geological conditions may place a producing formation in a limited area, while remaining area may be "dry." Likewise, multiple-producing formations may overlie one another in the same area. Preliminary studies will determine which of these conditions exist, and from which production should be obtained.

A producing formation or aquifer adjacent to the land surface is usually recharged (source bed) by local precipitation, while an area of multiple aquifers may have the recharge area at a considerable distance from lower producing formations.

Overpumping an aquifer should be avoided and limits are determined during development. These charts can be used as a procedure guide for determining ground-water supplies.

*Industrial consultant on ground water investigations, 1955 East Seventy-third Place, Chicago.

CAMERON *Forged Steel* WELL HEADS



Cameron Forged Alloy Steel Casing Heads and Casing Spools possess qualities of grain structure, homogeneity, and freedom from defects which cannot be produced by any other method. More than a score of interchangeable hangers are available to the operator.

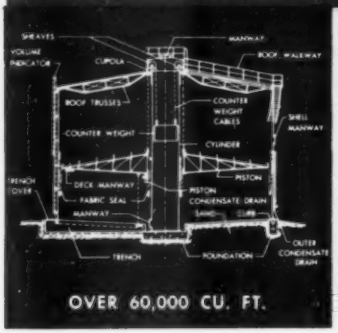
Cameron Forged Steel Ram Type Tubing Heads, a long-time favorite with many operators, are now offered in highest quality forged alloy steel . . . at no increase in price.

Cameron Forged Steel Flanged Tubing Heads possess the superior qualities of metallurgy that only press-forged alloy steel can produce. Numerous interchangeable hangers are available.

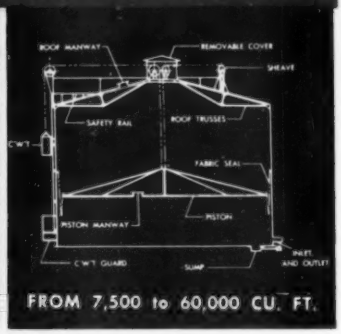
CAMERON IRON WORKS, INC.

P. O. BOX 1212 HOUSTON, TEXAS

WIGGINS *Dry Seal* GASHOLDERS



OVER 60,000 CU. FT.



FROM 7,500 to 60,000 CU. FT.

have proved a profitable investment, because they offer . . .

1. A Gasholder with efficient operation and easy maintenance.

a. Not affected by snow load since all moving parts are under cover.
b. All major moving parts accessible for inspection during operation.
c. A vapor balancer that can be made gas free for repairs in a few hours.
d. A vapor seal that has a life equal to that of the tank.
e. A Gasholder working pressure of ⅛ to ¼ inch of water.

2. A vapor balancer that has a 100% Dry Seal.

a. Eliminates corrosion problems attendant with wet seals.
b. Requires no heating system during freezing weather.
c. Has no evaporation loss through a water or oil seal.
d. Requires no attention, adjustment or lubrication.

3. One vapor balancing mechanism for all tanks.

a. Provides flexibility of operation.
b. Permits repair of any tank in group without affecting operation.
c. Allows vapor balancer to be removed without disturbing storage tank operation.
d. Accomplishes all venting through one master valve.
e. One structure for protection of all standing and pumping loss.

For more complete details and Pay-Out Analysis, write for Bulletin VB-10

GENERAL AMERICAN TRANSPORTATION CORPORATION

WIGGINS VAPOR SEALS
GENERAL AMERICAN

135 SOUTH LA SALLE STREET, CHICAGO 90, ILLINOIS

BRANCH OFFICES: New York · Washington, D. C. · Cleveland · Buffalo · Pittsburgh · New Orleans · Tulsa · Dallas · Houston · Seattle · Los Angeles · St. Louis · San Francisco

Sub-licensees

WESTERN STATES: Consolidated Western Steel Corporation San Francisco — Los Angeles
SOUTHERN STATES: Wyatt Metal and Boiler Works, Houston — Dallas, Texas
GREAT BRITAIN: Motherwell Bridge & Engineering Co., Ltd., Scotland
FRANCE: Etablissements Dulattre & Frouard réunis, Paris
CANADA: Toronto Iron Works Ltd., Toronto

Bacteria and Corrosion Control

(Continued from page 100)

at least 95 per cent kill. The results of the tests show that this can be accomplished by most of the bactericides at concentrations below 10 p.p.m. of active ingredient. Bionol, Purosan, and Arquad 2C yield 95 per cent kills at concentrations of 3 p.p.m. or less of active ingredient.

The presence of nonionic wetting agent acts as an inert diluent as is illustrated by the results obtained for Biopal G which consists of one part Bionol A to four parts Igepal CA. The curve for Bionol-Igepal 50-50 in Fig. 9 is dashed because the test was made on a water other than Gates flood water.

Laboratory Tests

As in the case of the corrosion-inhibiting properties, the laboratory tests of the bactericidal properties of these bactericide-corrosion inhibitors are not exact criterion of how effective they will be in field use. Considering the facts of different environment and different types of bacteria encountered in the field, these laboratory tests are used only for general screening purposes.

Laboratory tests are being continued to determine what chemical types will make the most effective bactericides and whether any beneficial effects may be obtained by combining one or more of these bactericides with each other and with other organic or inorganic compounds. These preliminary tests indicate that in general most of the high-molecular weight alky or alkyl aryl amine salts which show good corrosion-inhibiting properties also have good bactericidal strength.

Surface-active properties.—Most of the compounds tested as bactericide-corrosion inhibitors have surface-active properties by virtue of their molecular configuration. According to the procedure outlined under the section entitled "Test Methods" the surface-active properties of 14 compounds were determined for evaluation and comparison purposes. The compounds effecting the greatest lowering of the surface tension, namely Bionol A, Arquad 2C, and Cationic Amine 220 are some of the more effective bactericides and also acid corrosion inhibitors. An exception to this rule is rosin amine D acetate which has very little effect on surface tension and yet is a fairly good bactericide and corrosion inhibitor. As in the case of the surface tension lowering the more effective ones were the Arquads, Bionol, and Amine 220. Also, the compound with the least effect on interfacial tension is rosin amine D acetate, which actually increases the interfacial tension

especially at very low concentrations.

These measurements of surface-active properties are presented with no definite knowledge of how they affect the bactericidal and corrosion-inhibiting properties. However, since it has been established in the Pennsylvania Grade Crude Oil Association laboratory that the presence of surface-active chemicals in flood water can increase the intake rate of an oil sand it is valuable to know that this property is present in most of the chemicals that have proved to be effective bactericide-corrosion inhibitors.

Fig. 11 illustrates the effect of a nonionic wetting agent in increasing the water injection rate into an oil-saturated long core of oil sand. The detergent qualities may also be useful in cleaning the sand face of plugging materials resulting from bacterial action and corrosion. Of course, it is desirable to backwash the well being cleaned and not try to drive the material into the sand.

Source and cost of bactericide-corrosion inhibitors. — Table 3 lists the source and composition of the various bactericide-corrosion inhibitors and other compounds tested. They are all commercial products or blends of them and can be readily purchased in small or large quantities.

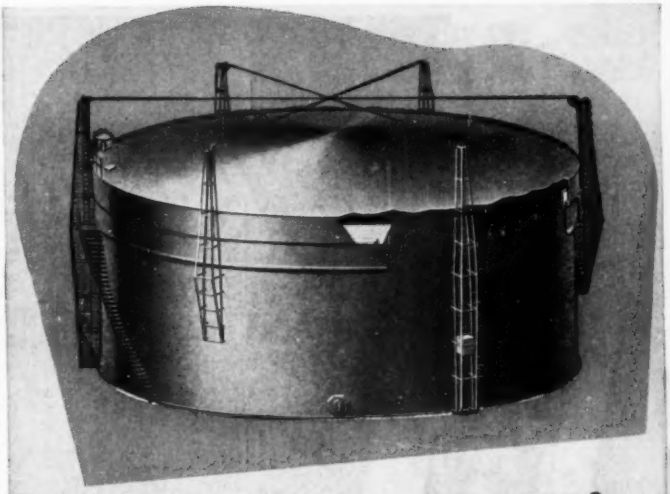
Although it was always kept in mind for practical reasons, the cost of these chemicals was not specifically considered in making these preliminary tests. The main object was the discovery and development of chemicals which showed promise of being effective bactericide-corrosion inhibitors. The prices of the amine compounds listed in Table 3 fall in the range from 32 cents to $3 per pound for 100 per cent active-ingredient material. Some of the most effective ones are in the range of 32 cents to $1.20 per pound. Assuming that 6 p.p.m. down to 1 p.p.m. respectively are necessary for effective treatment by this group the chemical cost of treatment figures out to be roughly 0.6 mil per barrel of water.

The potential low cost inherent in this method of treatment lies not only in the low cost of chemicals used but also in the relatively small amount of equipment necessary to treat and handle the water. Actually, all that is necessary to adapt a water system to this method of treatment is a chemical mixing barrel and a low pressure chemical feeder.

Conclusions

Laboratory tests have shown that alkyl and argyl high-molecular-weight amine salts and certain condensed ethylene oxide-amine compounds have considerable acid corrosion-inhibiting properties as well as being effective bactericides for killing aerobic and anaerobic bacteria common to oil-field waters. It has been proved by numerous tests that these compounds are effective corrosion inhibitors at concentrations below 10 p.p.m and some are lethal to bacteria at concentrations as low as 1 p.p.m.

The effectiveness of these compounds



THE WIGGINS DRY SEAL LIFTER ROOF

. . . can be used to conserve the vapors of a single tank, on which it is installed, or it can serve as a vapor balancing unit of several interconnected tanks.

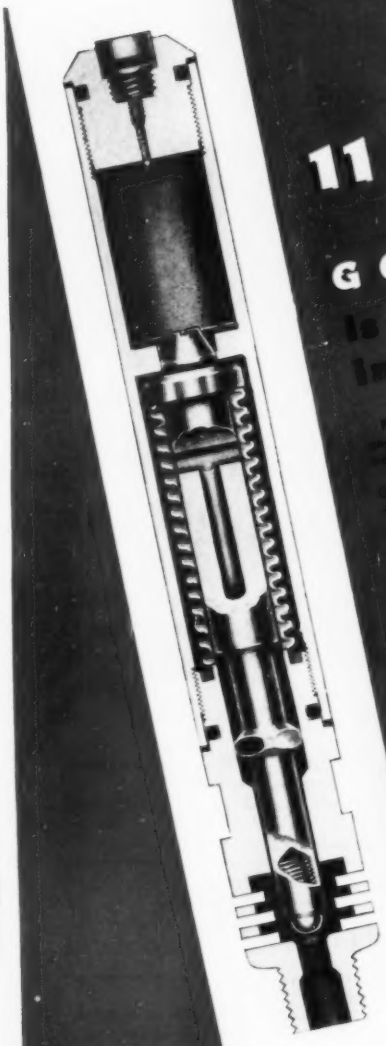
ADVANTAGES

THE SEAL	1 — 100% dry seal eliminates corrosion, heating and freezing problems. 2 — No maintenance other than periodic inspection required. 3 — No possibility of stored product being absorbed in seal and creating a fire hazard. 4 — Out-of-level tank grade does not affect seal operation.
COUNTER BALANCE SYSTEM	1 — Reduces operating pressure to 1¾" water. 2 — Reinforcement of interconnected tanks not required. 3 — All mechanism completely accessible from outside. 4 — Not affected by out-of-level tank grade. 5 — No lubrication required.
PRESSURE VACUUM RELIEF	1 — No leakage, absolutely gastight. 2 — All working parts outside tank and readily accessible for inspection. 3 — Simplicity. Single valve serves for both pressure and vacuum relief.

For further details, write for a copy of Bulletin VB-10.

GENERAL AMERICAN TRANSPORTATION CORPORATION
135 SOUTH LA SALLE STREET, CHICAGO 90, ILLINOIS
WIGGINS VAPOR SEALS GENERAL AMERICAN TRADE
BRANCH OFFICES: New York • Washington, D. C. • Cleveland
Buffalo • Pittsburgh • New Orleans • Tulsa • Dallas
Houston • Seattle • Los Angeles • St. Louis • San Francisco

Sub-licensees
WESTERN STATES: Consolidated Western Steel Corporation
San Francisco — Los Angeles
SOUTHERN STATES: Wyatt Metal and Boiler Works, Houston — Dallas, Texas
GREAT BRITAIN: Motherwell Bridge & Engineering Co., Ltd., Scotland
FRANCE: Etablissements Delattre & Frouard reunis, Paris
CANADA: Toronto Iron Works Ltd., Toronto



11 Reasons why GOT-OLSCO is your best buy In Gas Lift

Pressure-charged gas lift valves have proved to be the most efficient and economical method of secondary recovery in the vast majority of wells.

Of the pressure-charged gas lift valves now available, only the GOT-OLSCO Type "O" and its new variations, Type "OA" and "O-DP" are of the proportioning-bellows design.

Listed below are eleven reasons why these oil or these gas lift valves are your best buy:

1. Full Backpressure Protection, which not only protects pressure-charge, but also gas lift valves against backpressure.
2. Positive Pressure Control, which assures accurate, dependable operation.
3. Proportioning Bellows, which assures maximum production.
4. Simplicity of design and construction, which assures ease of operation.
5. Rugged construction of all parts, which assures years of trouble-free service.
6. Stronger Bellows, which withstand higher pressures.
7. Pressure Packing, which assures positive sealing without damaging valve seats.
8. Full Conservation, Parts of the three types of GOT-OLSCO Valves are interchangeable, permitting easy conversion from one type to another.
9. Easily Serviced in Field, All parts can be easily serviced in the field without repressuring of tubing.
10. Protected Against Sand, Efficient check valve prevents sand-laden fluids without damage.
11. Backed by the largest gas lift organization in the world, GOT-OLSCO Gas Lift Valves will produce any type of well more efficiently and more economically than any other method of artificial lift.

Full information on GOT-OLSCO Gas Lift Installations may be obtained from your GOT-OLSCO representative or from our Houston office.

DISTRIBUTOR:
GARRETT OIL TOOLS, Inc.
P. O. Box 6115
HOUSTON 6, TEXAS

got & OLSCO
PRODUCTION EQUIPMENTS
GAS LIFTS

MANUFACTURER:
OLSCO MFG. COMPANY
LONGVIEW
TEXAS

Alice Longview Odessa Victoria Wichita Falls Tyler Texas; Jennings Houma Monroe Louisiana

at such extreme dilutions makes them potential bactericide-corrosion inhibitors for the treatment of oil-field flood waters. They are most effective in air-free waters but may still be considerably effective in certain oxygen-containing waters. The compatability of some of the compounds with oil-field brines makes them promising water-treating agents where flooding must be done with brine.

It has been shown that the cost of treatment as applied to flood waters commonly used in Bradford-Allegany field would not exceed 0.6 mil per barrel. Besides the low cost of chemicals this method should be very economical because of the very small amount of equipment necessary for such treatment.

Since many of these potential bactericide-corrosion inhibitor compounds have considerable surface active properties they should be valuable in cleaning out intake wells and increasing the permeability of the sand to water.

Laboratory test methods are presented for determining the corrosion-inhibiting, bactericidal, and surface-active properties of these compounds.

Acknowledgments

The work reported on in this paper is part of the secondary-recovery research program of the Pennsylvania Grade Crude Oil Association carried out in the laboratory at Bradford. The author wishes to acknowledge Dr. Kenneth E. Anderson of St. Bonaventure College for his assistance with the bacteriological tests, and Joseph Saxon, Jr., Robert Bloomquist, and Willard Johnson of our laboratory staff for assistance with corrosion and surface-active property tests. Chemical samples and valuable suggestions for their use were generously donated by E. W. Segebrecht of Armour & Co., G. B. Martin of General Dyestuff Corp., W. E. Howell of Hercules Powder Co., and F. E. Latter of Purosan Co.

The cooperative interest of Dr. E. T. Heck and Kenneth Barton of Quaker State Oil Refining Corp. is gratefully acknowledged. The author thanks J. P. Jones, acting director of production research for the Pennsylvania Grade Crude Oil Association, for permission to publish the results of the tests.

Bibliography

1. Ireland, J. C., "White Algae," Producers Monthly, 9, No. 11, 14-16, Sept. 1945.

2. Holbrook, G., and Ellenberger, A. R., "Source and Purification of Water Supply," Producers Monthly, 10, No. 8, 57-60, June 1946.

3. Beck, J. V., "The Role of Bacteria in Oil Production," Producers Monthly, 10, No. 9, 29-31, July 1946.

4. Beck, J. V., "Prevention of Microbiological Growths in Water Flood Operations," Producers Monthly, 11, No. 12, 21-26, October 1947.

5. Barton, J. K., Brown, C. F., and Heck, E. T., "Slug Feeding of Sodium Hypochlorite on Water Flood Leases," Producers Monthly, 12, No. 4, 24-26, February 1948.

6. Breston, J. N., and Johnson W. E., "Effect of pH on Water Intake Rates of Oil Sands," Producers Monthly, 9, No. 12, 19-23, October 1945.

7. Miller, L. E., "Fundamental Chemistry of the Effects of Hydrogen Ions on Water Intake Rates of Oil Sand," Producers Monthly, 11, No. 1, 35-38, November 1946.

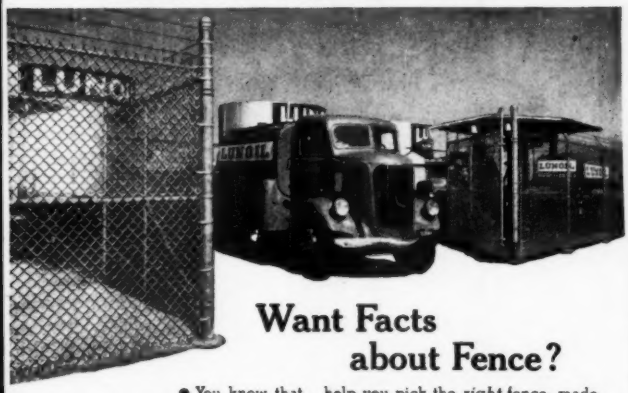
8. Miller, K. T., Morgan, F., and Muskat, M., "Some Permeability Experiments on Cores From Stephens Sand, Paloma Field, California," Producers Monthly, 11, No. 1, 31-34, November 1946.

9. Breston, J. N., "Amine-Type Wetting Agents as Acid Corrosion Inhibitors," Producers Monthly, 10, No.7, 19-22, May 1946.

10. Breston, J. N., and Barton, K., "Field Test of Corrosion Inhibitor for Low-pH Flood Water," Producers Monthly, 12, No. 1, 13-17, November 1947, and The Oil and Gas Journal, 46, No. 31, 91-96, December 6, 1947.

PAGE FENCE - Since 1883

• AMERICA'S FIRST WIRE FENCE •



Want Facts about Fence?

● You know that protection of persons and property is good judgment — and you intend to do something about it. To know *what* to do, write to Page Fence Association for illustrated facts. Note the several styles of Page Chain Link Fence and Gates. Then talk with our nearest association member. He will help you pick the *right* fence, made of the right metal in the right way, and will explain his right method of fence erecting. He is an experienced local fence specialist offering more than a product—a complete and reliable fence service. His name and address will be sent with the illustrated fence facts we offer you.

Write to PAGE FENCE ASSOCIATION in Monessen, Pa., Atlanta, Bridgeport, Chicago, Denver, Detroit, Los Angeles, Philadelphia, Pittsburgh, New York or San Francisco.

PRODUCT OF PAGE STEEL & WIRE DIVISION OF AMERICAN CHAIN & CABLE COMPANY, INC.

YOU CAN CUT PIPING COSTS with CATAWISSA PERFECT SEAL UNIONS

CATAWISSA HOT FORGED STEEL UNIONS priced to compete with better grade malleable iron unions

a type for every use! CATAWISSA STAINLESS STEEL UNIONS machined from solid bars

NEW LOW PRICE! CATAWISSA HOT FORGED STAINLESS STEEL UNIONS

WRITE FOR BULLETIN 10-A

DISTRIBUTED BY OIL WELL SUPPLY COMPANY BRANCHES SERVING ALL OIL FIELDS

NEW HYDRAULIC RIGS READY FOR FIELD TESTS

by Robert Harwick
District Editor

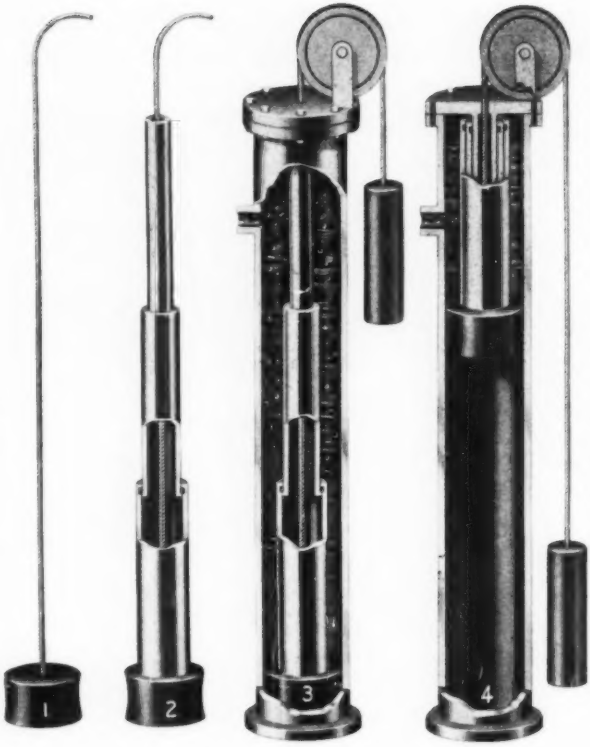


Fig. 1—Operation of the Mason principle: (1) One end of a wire line is fastened to a piston. (2) The line is enclosed by a series of nestable tubes, the bottom end of the tubes being fixed to the piston. Between each stage of the tubes is a seal. (3) This assembly is driven in a cylinder by means of hydraulic power. The other end of the wire line passes over a sheave which is mounted on a structure (not shown) and attached to the load to be lifted. When the piston has been pumped down the load has been lifted to its maximum height. (4) When the hydraulic fluid bleeds back through a variable orifice into the system reservoir, the piston-nestable tube assembly rises in the cylinder with a resultant lowering of the load. Air, compressed under the piston, aids in the ascent of the piston

NEW hydraulic rigs, one for drilling and one for servicing, which completely eliminate the draw works, traveling blocks, brakes, clutches, and most of the working wearable parts of the conventional rig were recently introduced to the oil industry. The heart of the machines consists of a series of concentric tubes, the largest of which is fitted with a piston inside a cylinder and the smallest of which is attached to the cylinder top. Oil is fed under pressure inside the cylinder above the piston, causing the tube series to elongate. A cable attached to the piston and running through the tubes and out the cylinder head and transmits piston movement to the load. Hydraulic power is also used for rotary-table operation.

Two rigs were displayed at a recent preview. One is for drilling 5,000 to 6,000 ft. with $4\frac{1}{2}$-in. drill pipe. This rig, in experimental stages at this time, will be used to drill wells in Texas. The other rig is recommended for pulling 2,500 ft. of $2\frac{1}{2}$-in. tubing or 7,000 ft. of rods. These depth ratings are nominal and include an acceleration factor of 40 per cent. This servicing rig had its initial field tests at Signal Hill.

These are the first of a complete line of drilling, workover, servicing, pumping, and combination pulling-pumping units contemplated by the company.

These hydraulic rigs feature the patented Mason principle. (See Fig. 1). Note that since the lowermost of the nestable tubes is secured to the piston and the uppermost is secured to a cap over the cylinder, the tubes act as a sheath for the wire line. The hydraulic fluid which applies power to the piston is not in contact with the wire line, but is confined entirely to the annular space between the outside of the nestable tubes and the

Fig. 2—One of the new hydraulic units is shown here rigged up over a well. Note the remote position of the driller's controls from the power unit, mounted on a semitrailer. Two thousand five hundred feet of $2\frac{1}{2}$-in. tubing can be handled by the servicing rig

petroleum engineers have insulation problems, too!

Take the case of . . . periodic inspection of hot oil lines. Sounds simple, doesn't it? Apparently not much of a problem there. Yet the periodic removal of insulation can be mighty costly and time-consuming unless material is applied that lends itself to frequent handling. What's more, repeated removal lowers the efficiency of ordinary insulations and very often necessitates replacement.

So . . . we have a suggestion. Apply a combination of Super and Standard Unibestos *in single layer construction.*

And here's why:

1. Unibestos is made in time- and labor-saving single layer construction.
2. Unibestos, easy to remove, can be set aside during pipe inspection, then just as easily reapplied . . . with no loss of efficiency.
3. Unibestos has high structural strength. With ordinary handling care, breakage is exceptionally low.
4. Unibestos is physically and chemically stable . . . Resists deterioration at high temperatures.
5. Unibestos in the original application is a money saver, too. Its one-layer construction is easy to cut, fit, strip and apply. Assures substantial savings in application costs.

unibestos is recommended for temperatures up to 1200° F. No. 750 is suitable for temperatures up to 750° F. No. 1200 or Combination are recommended for temperatures up to 1200° F. These temperature ranges permit the use of one material at maximum efficiency for a wide variety of purposes. Unibestos is available in half sections up to 30" pipe diameter in quadrants up to 60" diameter, and in cylindrical form where specified. No. 750, No. 1200, and Combination are all furnished in single layer construction, but are also available in double layer construction to provide for expansion in piping, where required.

UNARCO

UNION ASBESTOS & RUBBER CO.

General Offices: 1821 S. 54th Ave.
Cicero 50, Illinois
New York . . . San Francisco
Paterson, N. J. . . . McGregor, Texas

UNION ASBESTOS & RUBBER CO.
1811 South 54th Avenue
Cicero 50, Illinois

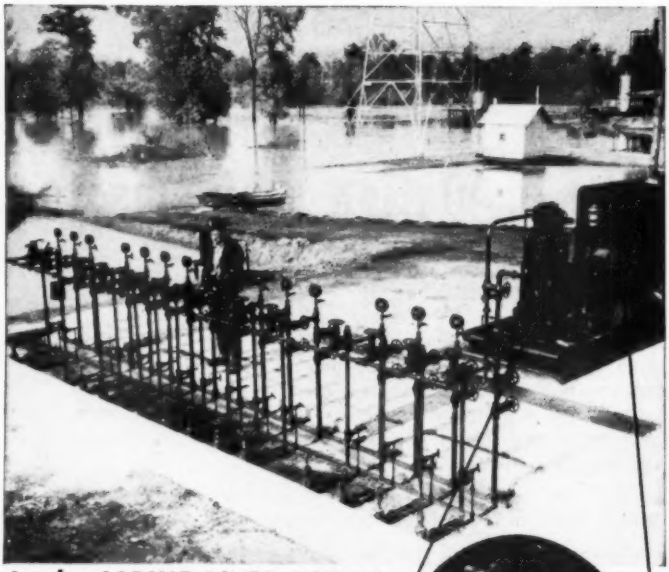
Gentlemen:

Please send illustrated folder showing sizes, prices, conductivity curves and technical information to

Company_____

Address_____

Name_____ Title_____

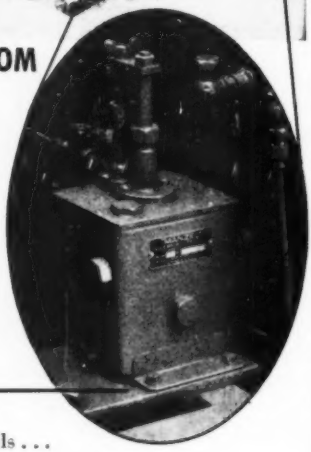


In the SABINE RIVER BOTTOM

—Hydraulic Pumping with Kobe Triplex

and a

MANZEL CHEMICAL FEEDER



In the Sabine area nearly 200 wells . . . are being pumped hydraulically from central plants like that shown here. Located on special fill, the plants continue uninterrupted throughout flood stage.

Virtually every Kobe Triplex, which supplies power to operate these bottom hole hydraulic pumps, is equipped with a Manzel Chemical Feeder to treat oil for emulsion. Various compounds are used, depending upon bottom hole conditions encountered. The chemical is introduced by the feeder into the power oil before it passes through the Triplex and down the power oil tubing to actuate the pump, thereby insuring bottom hole treatment.

The record of Manzel Chemical Feeders for dependable, trouble-free operation is unsurpassed in oil line treatment. Let us show you how perfectly Manzel Feeders can fill your needs. Write today.

Manzel Inc. now supplies repair parts for all models of Bowser and Torrington Lubricators.

Builders of HIGH PRESSURE METERING PUMPS Since 1898

Manzel INC.

336 BABCOCK STREET, BUFFALO 10, N. Y.

inside of the cylinder. This precludes the necessity of packing off around the wire line.

Translated into terms of an oil-field hoisting rig, the cylinder (or cylinders for heavier rigs) are built into a portable mast or derrick. The wire line is passed over the sheave, or sheaves, comprising the crown block and then directly to the hook. Since multiple-line reeving is not employed, the traveling block is eliminated.

Power is supplied by internal-combustion engines driving centrifugal pumps. When more than one engine-pump combination is used, multiplied volume or pressure can be obtained by running the pumps in parallel or in series, the more engine-pump combinations being used the greater variety of speeds that can be obtained. It follows, therefore, that on the larger-capacity rigs, batteries of small, inexpensive, high-speed engines, each with its own pump can be employed as substitutes for the large, relatively expensive, slow-speed engines common to the medium and heavy-class conventional rig.

It is interesting to note that the absence of shock loads in the operation of these hydraulic rigs, manufactured by M. O. Johnston Oilfield Service Co., may well open up a new field for the $200 to $300 class engine. This becomes evident in considering the endurance test run on the small rig exhibited at Tulsa. After the rig was returned to California from the Tulsa exposition, it was placed over an open hole, loaded to capacity, and cycled continuously for the purpose of determining which rig component would go out first.

After 4½ billion foot-pounds of work, a crown sheave bearing overheated and went out because of inadequate lubrication. The small high-speed engine used, representing an investment of about $250 was placed back in service without so much as cleaning the spark plugs.

It is even more interesting to note that the wire line, nestable tubes, seals, and pistons on this rig showed no appreciable evidence of wear. The only other rig wearable, the centrifugal pump, was also placed back in service untouched and is still operating efficiently.

Centrifugal pumps are employed as the means of power transmission for these rigs because of their simplicity, low cost, and the absence of such wearables as liners, valves, and valve seats. They provide infinitely variable speed characteristics in a manner similar to electric motors or steam engines. The sand reel, an optional accessory, is driven by a hydraulic motor which draws from the same fluid supply as the centrifugal pump. Rotary tables on the drilling rigs are also driven by hydraulic motors.

A variety of derrick designs can be employed to serve as working media for the Mason principle. Through

elimination of the weight of the conventional draw works, auxiliary brakes, compound, and traveling block, a structure heavier than is generally encountered in oil-field derricks can be built and still maintain legality over the highway. An example of this is the portable derrick of the experimental drilling rig which moves in one piece over the road but which, when rigged for drilling, is a self-supporting, four-legged structure, capable of withstanding a wind of 70 m.p.h. from any direction and under any condition of load. No guys or exterior supports of any kind are used on this derrick. Rig-up time is 2 hours and it is thought that an experienced crew could better this by half.

Versatile and Stable

Another example of the stability that can be achieved in these structures is the portable mast of the servicing rig. This mast moves in a single package over the road, is legal in all respects, and is rigged up and ready to pull rods in 7 minutes. Through the application of outriggers, no external guys are required. Four integrally built guys, which rig up automatically as the mast is erected, are the only support needed for this particular service.

The servicing unit is an exceedingly flexible rig. Since the Mason principle works as well in a horizontal position as in a vertical, the same rig that is used over open wells can be used to pull rods and tubing under conventional production derricks. The tubing line is reeved over the production derrick's crown block and the rig is ready to pull doubles of rods and tubing.

Over an open well, the mast is designed to pull singles of rods and tubing which can be tailed if that method is preferred. Or the user can hang the rods and stand the tubing back from the racking platform, provided as an optical accessory.

A two-axle truck was used to pull the rig over the grades and turns on Signal Hill during field tests there.

The control system of the servicing unit is quite simple. One lever acts as accelerator, brake, and control. The hook can be stopped at any desired spot. Actual maximum empty hook speed was clocked during the display at 3½ seconds for the upstroke and 3 seconds for the downstroke. The hook was rigged for lighter rod loads. This speed can be materially reduced where slower speeds are needed.

A valve, which acts as a variable orifice, controls the return of the fluid to the reservoir, governing the fall of the empty hook. Collision with the crown by the hook need not be considered as a factor in the operation of any of these hydraulic rigs because, when the piston in the cylinder is bottomed out, the hook is at the top of its stroke and can rise no further.

SPECIFICATIONS OF SERVICING UNIT

*Capacity, in singles under mast—	
—2½-in. tubing	2,500 ft.
—⅞-in. rod	7,000 ft.
*Capacity, in doubles under conventional production derrick—	
—2½-in. tubing	1,250 ft.
—⅞-in. rod	3,500 ft.
Maximum available hook pull	28,000 lb.
Maximum hook stroke—under mast	34 ft.
—under conventional production derrick	68 ft.
Height of mast erected	49 ft. 2 in.
Over-all length of rig over the road	49 ft. 2 in.
Over-all width of rig over the road	6 ft. 8 in.
Over-all height of rig over the road	11 ft. 0 in.
Diameter of crown sheave	24 in.
Diameter of tubing line	1 in.
Rig-up time	7 minutes
Nominal b.hp. input	425 psi.
Maximum system hydraulic pressure	425 psi.
Maximum volume	600 g.p.m.
Recommended vehicle	Ford F-6 or equiv.
Weight, less vehicle and sand line reel	3,300 lb.

*With acceleration factor of 40 per cent allowed.

Introducing the NEW
IMPROVED CHAMPION SNATCH BLOCK
Featuring the SPEED NUT

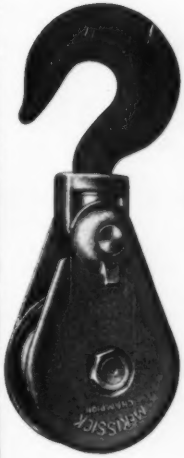


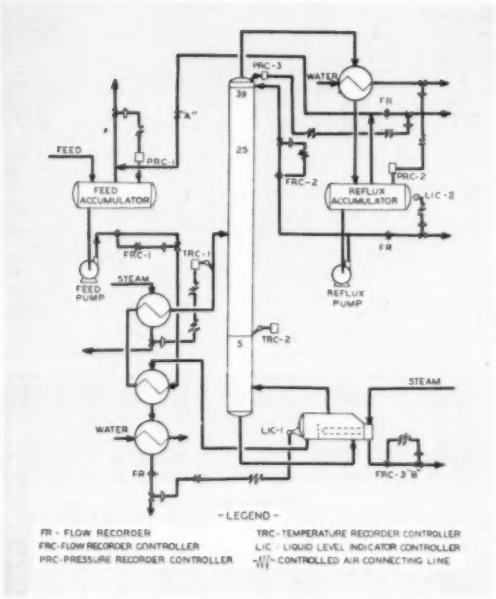
Fig. 422

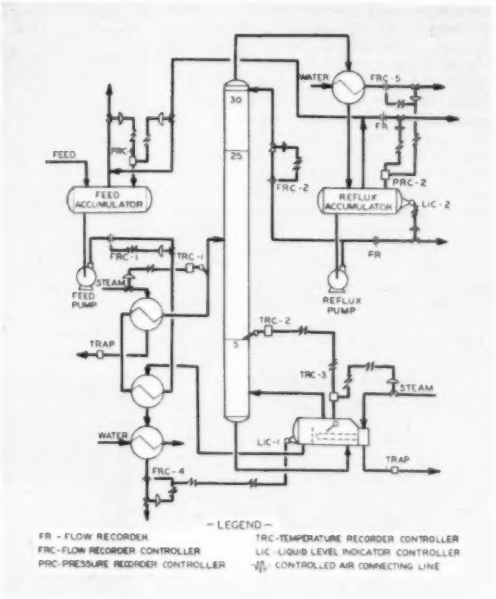
New "Speed Nut" eliminates all lower bolts, greatly facilitating opening and closing of block. No bolts to unscrew, pull out and lose. Two quick turns of "Speed Nut" and block is ready to open or close. Nut is never completely removed, and cannot be lost. Hook and clevis quickly interchangeable. For safe working loads up to 25 tons. Made from drop forged, heat treated, selected steel.

Write for Special Bulletin for complete details.

McKISSICK

McKISSICK PRODUCTS CORPORATION
Box 2496 Tulsa, Oklahoma





INSTRUMENTATION OF DEPROPANIZER

Fig. 1—Before changes

Fig. 2—After changes

Revised Depropanizer Instrumentation

IMPROVES PLANT OPERATION

by H. B. Breedlove

THE number of instrument adaptations and problems has increased in the Baton Rouge refinery of Esso Standard Oil Co. to the extent that personnel in the technical division have been assigned to specialize in this work. The problem of controlling light-hydrocarbon towers so the products will meet more precise specifications is one example of the activity in this field.

Improved operation of a depropanizer was recently obtained by revision of instrumentation and addition of first derivative control to instruments subject to considerable process lag. Upset tower conditions are less frequent and product quality has shown considerable improvement. Difficulties in controlling this tower have been lessened considerably.

Of conventional design, the depropanizer consists of a 30-tray tower with associated feed, reflux, and product condensing and withdrawal equipment. This unit was designed primarily to produce an overhead product of low C_3 content. The tower is operated at higher-than-normal pressure because of the presence of small percentages of C_1 and C_2 in the feed.

Instrumentation Revised

The instrumentation as originally designed did not provide the operator with adequate control facilities to maintain specified operating conditions. Frequent upsets and relatively long periods of temperature and pressure cycling resulted in "off specification" products and degradation of material. Skilled operators could not maintain proper operating conditions when the tower was operated at designed maximum feed rate. Slow response of controlled variables and instability of the control system were considered the primary causes of unsatisfactory operation. A simplified flow diagram of the unit with original instrumentation is shown in Fig. 1. It will be noted from Fig. 1 that the original instrumentation was of conventional design and contained no unusual features. Changes made to improve operation are discussed below.

The Author

H. B. Breedlove is presently assigned as specialist in instrumentation at the Baton Rouge refinery of Esso Standard Oil Co. He joined the company in 1938. He attended Louisiana State University from 1923 to 1925. During World War II he was assigned to Chief of Automatic Flight, at which time he was coinventor of the automatic flight controller, push-button flight.

Changes to feed accumulator pressure controls.—It was found that the feed accumulator pressure controller (PRC-1, Fig. 1) was inadequate. The feed accumulator drum was repressured with gas from the reflux accumulator drum by means of a hand control valve (A Fig. 1) which required frequent adjustment by the

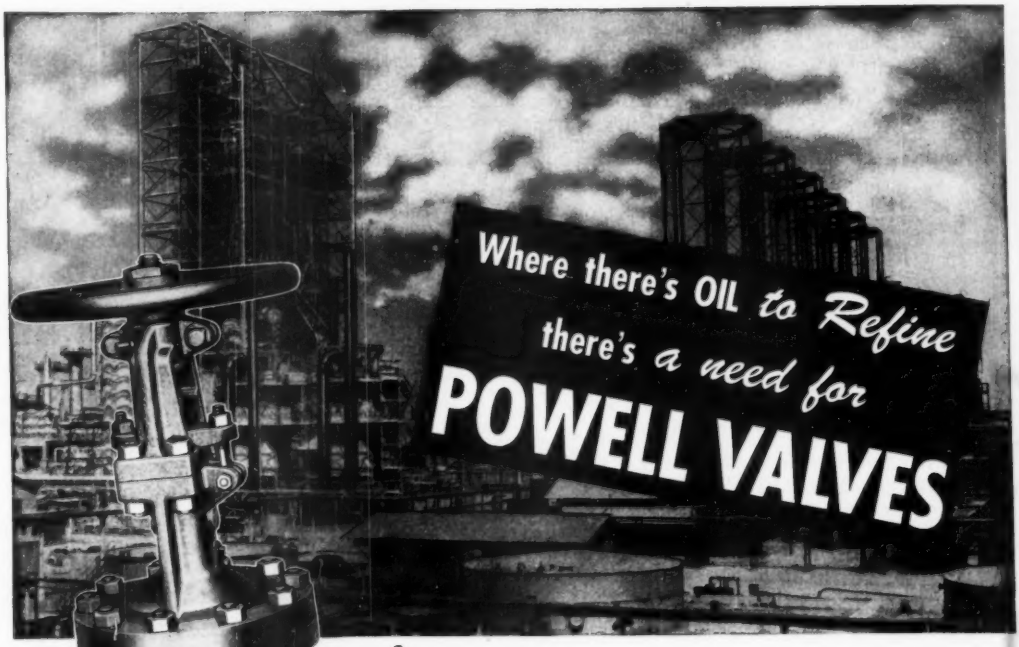
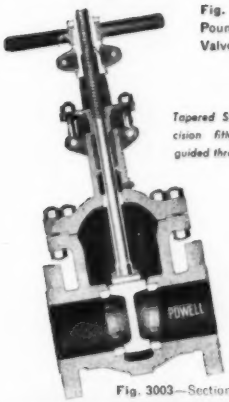


Fig. 3003—Class 300 Pound Cast Steel Gate Valve.



Tapered Solid Wedge is precision fitted and accurately guided throughout entire travel.

Fig. 3003—Sectional.

Yes —wherever crude is being refined, there *is* a definite need for Powell Cast Steel Valves*

These valves—stock and special designs, made in all required sizes and in Classes from 150 to 2500-pounds, inclusive—conform to A.S.A. and A.P.I. Standards. They can be furnished with anti-friction bearing yoke for easier hand operation, or with gears, electric or air motor operators.

In addition to Standard Cast Steel and Special Cast Steel Valves, the Powell Line includes all types of Bronze and Iron Valves, as well as Corrosion-Resistant Valves that are available in the largest selection of metals and alloys ever offered to Industry.

So, no matter what your flow control requirements may be—whether for handling high pressures, high temperatures, water, oil, gas, low pressure steam or for corrosion service—there are Powell Valves to meet them. When sending for details mention the kind of valves in which you are interested.

The Wm. Powell Co.

Dependable Valves Since 1846

Cincinnati 22, Ohio

Distributors and Stocks in All Principal Cities

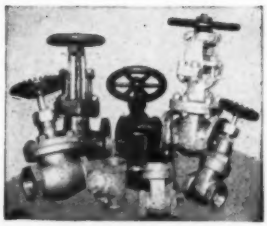
* Valves can be made of various alloy steels, including corrosion-resisting and heat-resisting alloy steels. They are designed and built to handle the constantly increasing temperatures and pressures as well as the highly corrosive and erosive fluids encountered in the chemical and process industries—to handle hydrogen chloride in isomerization and diisopropyl plants; hydrofluoric acid, sulphuric acid and sodium hydroxide in alkylation plants; for liquid and solid catalytic cracking; hydrogenation, dehydrogenation, hydroforming, polymerization, the regeneration of catalysts; for controlling flue gases and hydro carbons in transfer lines, and for the handling of sour crudes.

POWELL VALVES

HENRY H. PARIS DISTRIBUTOR Inc.

Manufacturer's Agent - Oil Well and Refinery Supplies

P. O. BOX 932 HOUSTON, 1125 ROTHWELL ST. TEXAS



"Oh I See lower costs with O.I.C. VALVES"

OIC valves give you all of these benefits: Longer uninterrupted service; Lower maintenance and replacement costs; Minimum over-all cost. They've been doing it for users everywhere, as impressive performance records attest. OIC valves are backed by more than 57 years of engineering skill, manufacturing integrity and outstanding valve performance. In OIC's you get all the benefits that it is possible for valves to render.

Agent and Distributor for the following Nationally known Manufacturers

W. C. NORRIS MANUFACTURER, INC.
Tulsa, Oklahoma
Quality Pumping Equipment, Swage Nipples, Bull Plugs, Welding Fittings, etc.

WHEELING MACHINE PRODUCTS CO.
Wheeling, West Virginia
XL Steel Pipe Couplings for OIL COUNTRY TUBULAR PRODUCTS. Gas-Water-Steam.

THE OHIO INJECTOR COMPANY
Wadsworth, Ohio
OIC VALVES, Bronze, Iron and Steel, for all purposes. "Oh! I see Lower Costs with OIC."

HARRISBURG STEEL CORPORATION
Harrisburg, Pennsylvania
Forged Steel Flanges and Seamless Casing Couplings.

VOLCANO BURNER COMPANY
Houston, Texas
Volcano Superior and Gulf States All Steel Gas Burners for OIL COUNTRY BOILERS.

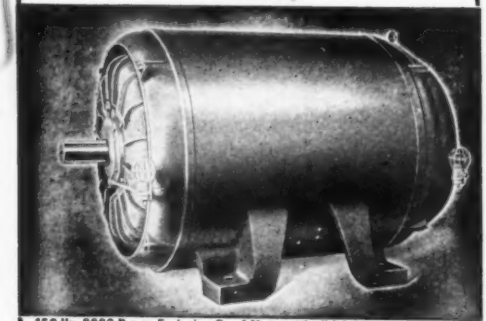
OIL STATES EQUIPMENT COMPANY
Houston, Texas
OSECO Silvertop Fusible Plugs with renewable inserts for all types OIL COUNTRY BOILERS.

DRESSER MANUFACTURING DIV.
Bradford, Pa.
Seamless Welding Fittings.

Norris Quality Products

W. C. Norris swaged nipples, bull plugs, stuffing boxes, sucker rods, polished rods, welding caps and other equipment are backed by 63 years manufacturing experience, assuring the user highest quality for the utmost in efficient performance and service at no increase in cost.

Continental
EXPLOSION-PROOF MOTORS
1 to 600 Hp.



150 Hp. 3600 R.p.m. Explosion-Proof Motor with oil lubricated ball bearings

CONTINENTAL ELECTRIC CO., Inc.
Plants—Newark 5, N. J., Rockford, Ill.

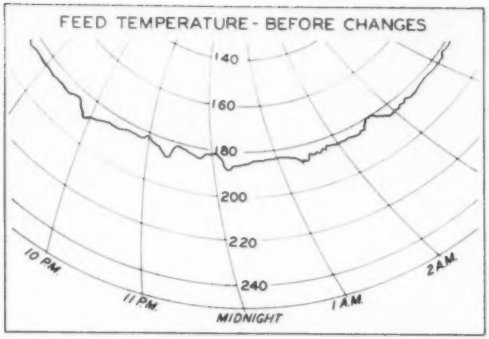
Continental ELECTRIC MOTORS

"I'll take the WHITE one every time!"

WYTEFACE "A"
Trade Mark
Steel Tapes for the Oil Industry

WYTEFACE "A" Steel Tapes have raised black graduations on a crack-proof white surface. Easy to read in any light, from any angle. Designed for hard service. Resist rust and corrosion. Raised rims and markings protect the white background from abrasion from rails, pipe, rocks, concrete. Made in styles especially for Oil Riggers, Oil Gaugers and for general measurements. See your supply house, or write for details to Keuffel & Esser Co., Hoboken, New Jersey.

KEUFFEL & ESSER CO.
EST. 1867
NEW YORK • HOBOKEN, N. J.
Chicago • Detroit • Los Angeles
St. Louis • San Francisco • Montreal



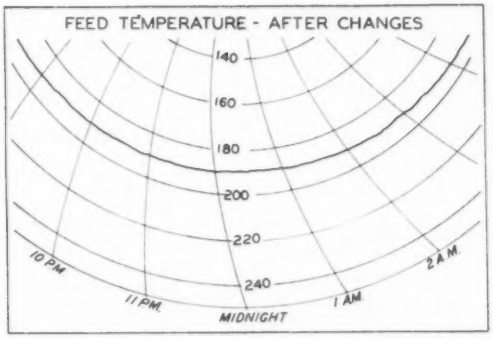
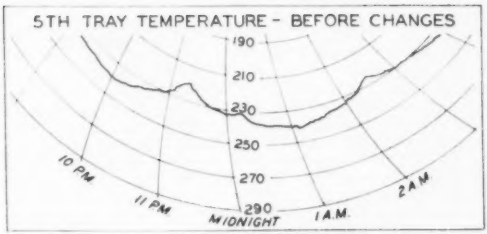
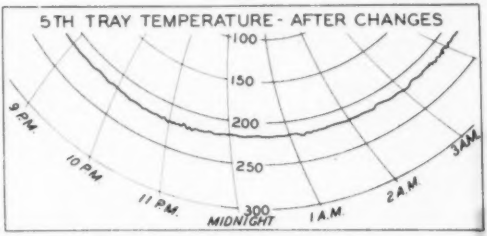


Fig. 3





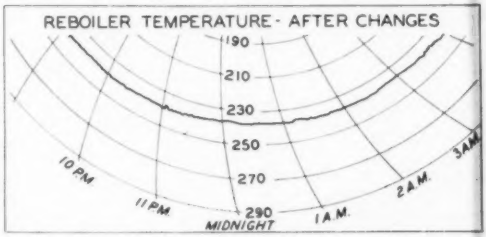


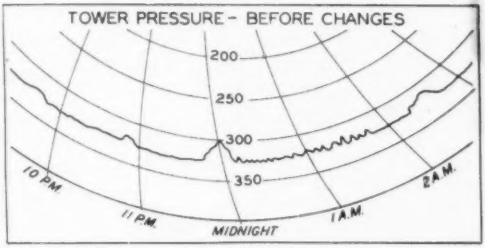
Fig. 4

operator. The hand-controlled repressuring valve was replaced with a pneumatic control valve positioned by a second control mechanism installed in the pressure controller. Excess pressure is relieved by venting gas to the refinery fuel-gas line. The index of the repressuring control mechanism is usually set 1 lb. below, and the vent control mechanism index is set 1 lb. above the pressure desired. The feed drum is either repressured or vented to maintain pressure within desired limits as the vapor pressure of the feed changes. Fig. 2 shows changes made in the hookup of PRC-1.

Changes to feed preheater temperature controls.—The feed preheater circuit was a sources of trouble, primarily because of the lag of the steam condensate removal control system. Changes in heat demand due to erratic flow of bottoms product through the bottoms-feed exchangers were too frequent to permit satisfactory operation with this type of control. Steam at 120 psig. was applied to the shell side of the preheater, and heat input was controlled with a control valve in the steam-condensate removal line. As heat demand varied the condensate level changed which in turn varied the effective tube area. This system gave poor heat-input control and as a result feed temperatures were not held within the desired limits.

Changes made in the steam-condensate-removal control system consisted of the addition of a pneumatic derivative control unit to the existing temperature controller TRC-1. The stem condensate removal valve was replaced with a continuous drain-type steam trap and a diaphragm-operated valve was installed in the line supplying steam to the preheater. This valve is operated by the feed temperature controller. With the original hookup it was necessary to set the throttling range of the temperature controller at approximately 60 per cent to prevent cycling. This controller can now be operated with a throttling range setting as low as 5 per cent without difficulty. Fig. 3 shows feed temperature charts before and after instrument changes.

Changes to tower bottoms temperature and flow controls.—The original tower bottoms temperature control system consisted of a temperature controller (TRC-2 Fig. 1) with a sensing point on the fifth tray from the



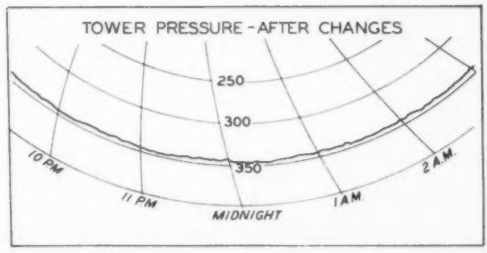


Fig. 5

tower bottom, and connected to operate a valve (B Fig. 1) in the reboiler steam-condensate-removal line. Soon after the initial startup of this unit the bottoms temperature-control system was abandoned as inoperative, because of instability and as an emergency measure a flow controller (FRC-3 Fig. 1) was installed in the steam condensate line and connected to operate the valve B. This system provided no tower-bottoms temperature sensing and required frequent attention by the operator.

Modification of the tower-bottoms temperature-control system consisted of the installation of a temperature controller (TRC-3 Fig. 2) with remote pneumatic index set and derivative control mechanism, with a sensing point in the reboiler. This controller was connected to operate a valve installed in the line supplying steam to the reboiler. The fifth-tray temperature controller was connected to index set the reboiler temperature controller. The flow controller and valve in the steam-condensate line were replaced with a continuous drain-type steam trap. With this cascade control system, desired tower temperature is set by the fifth-tray controller which in turn resets the reboiler temperature controller (TRC-3 Fig. 2). The reboiler temperature control acts as a followup system for the fifth-tray controller and adjusts for changes in reboiler heat demand.

The system has proved very stable and has given consistently good results as can be seen in Fig. 4, showing fifth-tray temperature before and fifth-tray and reboiler temperatures after changes were made. The reboiler level control (LIC-1 Fig. 1) was connected to operate a bottoms-product valve. No bottoms pump is provided and the tower pressure is used to deliver the bottoms product to storage. Variations in tower pressure resulted in changes in differential pressure across the bottoms product valve causing variations in bottoms product flow rate without changes in valve position. Since the bottoms rate was affected by both the level controller and the tower pressure, there was considerable variation in feed temperature at the outlet of the feed-bottoms exchanger. The bottoms-product flow recorder was converted to a flow controller with remote index set and connected to operate the bottoms-product valve. The reboiler level controller was connected to index set the flow controller. With this change the flow controller repositions the bottoms valve to compensate for changes in differential pressure across the valve and the bottoms flow rate is varied only by changes in the reboiler level. More even flow of bottoms product has reduced temperature variation of feed to the preheater and has required less corrective action by the feed temperature controller.

Changes to tower pressure controls.—The tower pressure-control system originally consisted of a pressure controller (PRC-2 Fig. 1) with pressure point on the reflux accumulator controlling water from the overhead condensers, and a pressure controller (PRC-3) with pressure point on the tower top controlling a vent valve from the reflux accumulator. PRC-3 was eliminated and an additional control mechanism with derivative control was added to PRC-2. A remote pneumatic index set flow controller was installed in the water line leading from the overhead condensers and connected to operate the water valve. The pressure-controller mechanism with derivative control was connected to index set the water flow control meter (FRC-5 Fig. 2) and the second mechanism was used to position the vent valve. The tower is usually operated for total overhead product condensation, and pressure is maintained by control of water through the condensers. Some difficulty has been encountered with this pressure control system because of high temperature of the cooling water. Improvement has been shown over the previous system. Fig. 5 shows typical charts of tower pressure before and after changes were made.

Operation After Revision

The revised arrangement of instrumentation has proved superior to the original system. Operating stability of the tower has been improved and a better "on specification" service factor obtained. Upsets occur occasionally but are usually of short duration and are normally corrected by the instruments without manual adjustment by the operator. Figs. 3, 4, and 5 are typical pressure-and-temperature charts obtained before and after the changes were made.

Derivative control may be used with throttling and reset action to obtain quick response or to improve response in systems where considerable lag exists. It should be used only in those cases where a concrete operating advantage is obtained by its use. Three such units have been employed. In each case temporary overcorrection, proportional to the rate of deviation of the process variable, tends to compensate for the lag between detection and corrective action and has reduced cycling. Portions of the control circuit, such as the feed accumulator pressure, not subject to sharp fluctuations are adequately controlled by conventional control methods. Derivative controls may also be used in cascade control systems such as the bottoms temperature-control circuit.

Experience with the control of this and similar towers has shown that steam-condensate-removal control systems are not suited for installations where abrupt changes in heat demand are experienced. With the condensate control system a change in condensate level in the reboiler is necessary to effect a change in the rate of heat input. There is no change in pressure of the condensing steam and all steam condensate is removed at the temperature of condensing steam at line pressure.

The control method outlined in this article will often provide an equivalent amount of heat input with lower steam consumption. All tubes in the reboiler are exposed to condensing steam and control is obtained by throttling steam to the reboiler. The condensing pressure is low and the condensate leaves at a lower temperature, thus effecting a small steam economy. The condensate control system is very attractive from the standpoint of installation cost and can very often be justified where heat demand is almost constant or accurate control is relatively unimportant.

Highest Barrel-per-Acre Recovery

(Continued from page 112)

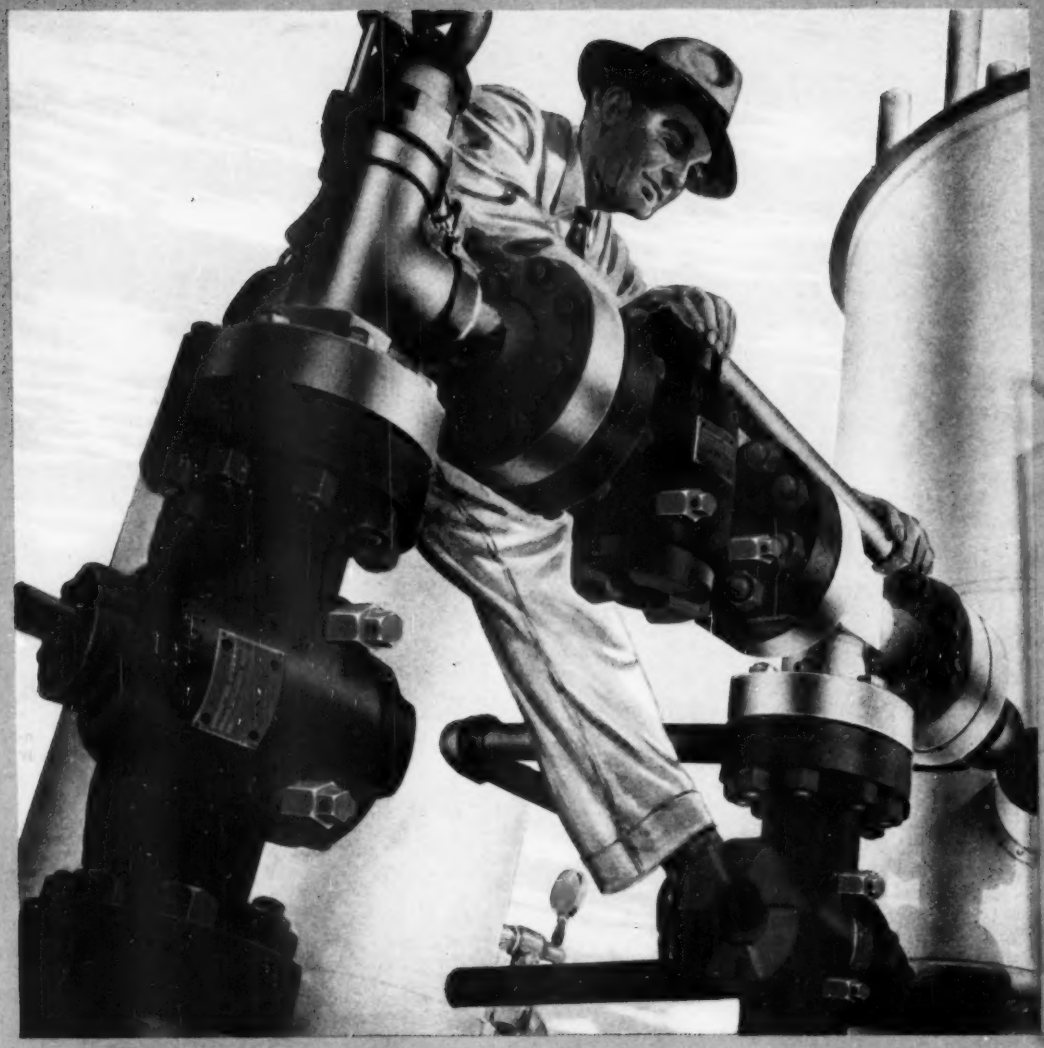
5,039 ft. deep, was originally drilled to the Tensleep, and later deepened. The other new pay zone is the Cambrian mentioned above, which has a daily average production of 1,750 bbl. Cumulative production from the Cambrian on June 1 was approximately 330,000 bbl.

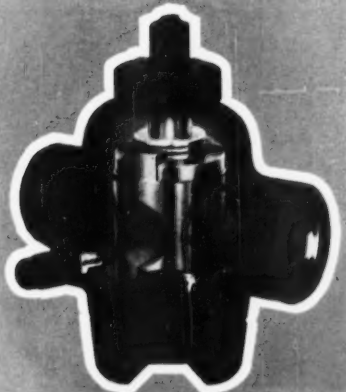
Cambrian Pay

Bottom-hole pressure in the new Cambrian pay in January 1949, at datum of plus 1,000 ft., was 2,525 psi. This was 6 months after the date of discovery. Flowing pressure under natural flow after a 24-hour drawdown period was 1,863 psi. The natural flow rate at this time was 504 bbl. per day, and the natural flow productivity index was 0.761 with a gas-oil ratio of 108 : 1. Bottom-hole temperatures in the two wells drilled is about 180 F. Oil produced is of 35° gravity.

The formation 845-ft. thick, is a coarse conglomerate with some shale and limestone streaks, and is varicolored and has fair porosity. This is reputed to be the only Cambrian production in the Rocky Mountain area—the oil is thought by geologists to have migrated downward from source beds above.

Of the 146 wells which have been drilled in the field, 61 are now capable of production. Two new production wells are now being drilled. Cumulative production from all zones on June 1 was 39,267,000 bbl., a recovery of 37,400 bbl. per acre, based on the area of the Tensleep pay, giving a much lower value than the actual since higher pays have a smaller areal extent.





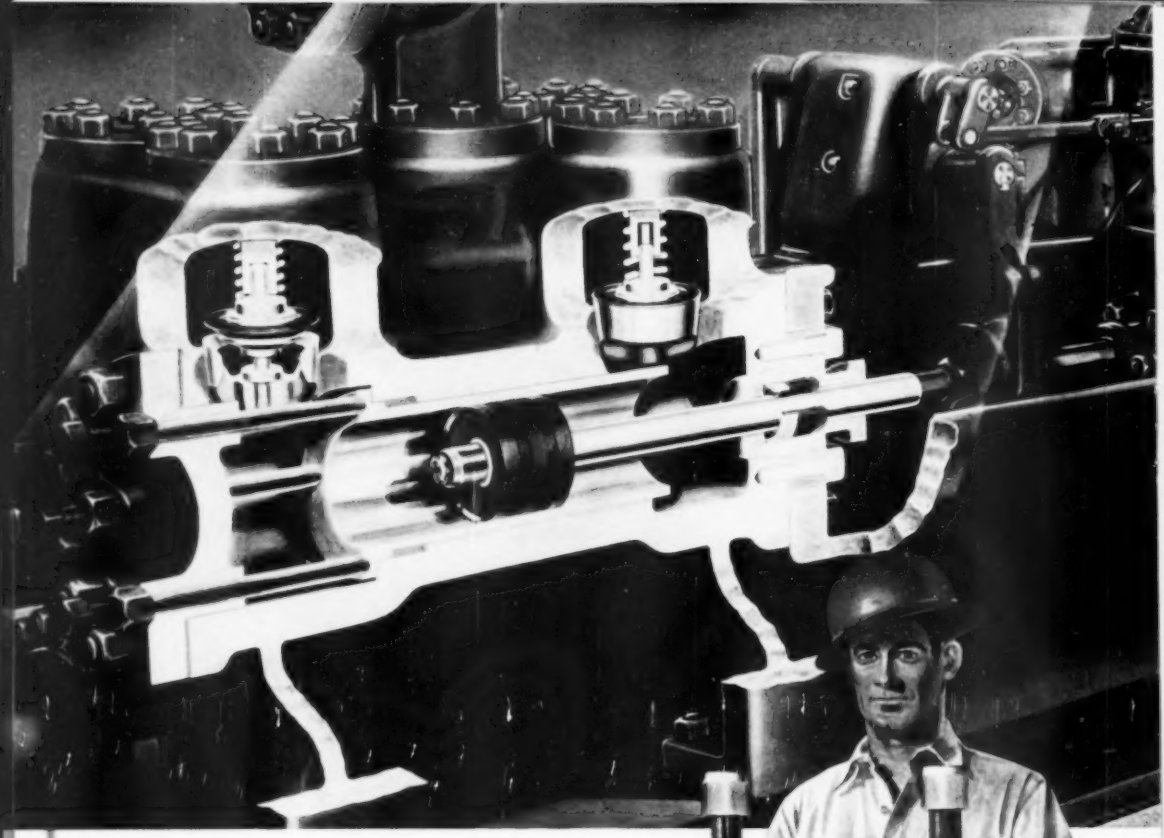
MISSION Automatic-Lubricated Plug Valve

MISSION *Automatic-Lubricated* PLUG VALVES

. . . offer this tremendous advantage: You do not need to adjust a lubricating screw every time you operate the valve. Each core-half contains a lubricant reservoir, and lubricant is fed *automatically*, by *line pressure*, to the downstream lubricating grooves. Pressure on lubricant is *continuous*, not intermittent. Ask for full information . . . Mission Mfg. Co., Houston, Texas. Export Office: 30 Rockefeller Plaza, New York. European address: London, England.

MISSION MANUFACTURING CO.

G 204-A



WORLD'S MOST DURABLE SLUSH PUMP PISTON RODS

The success of Mission Manufacturing Company has been due, in large part, to the development of its superior, more durable slush pump parts. MISSION Piston Rods are one outstanding result of this specialization.

The MISSION Super-Surfaced* Piston Rod (left) is the finest on the market. Under corrosive conditions it lasts up to 4 times as long as ordinary rods. Under normal conditions it has about double the life of File-Hard Rods.

The MISSION File-Hard Piston Rod (right) is excelled only by our Super-Surfaced Rod. We are now furnishing our File-Hard Rod with a new ultra-smooth "Satin Finish" which results in longer packing life and perfect finish on crosshead threads and taper ends . . . Mission Manufacturing Co., Houston, Texas. Export Office: 30 Rockefeller Plaza, New York. European address: London, England.

*REG. U. S. PAT. OFF.

MISSION MANUFACTURING CO.

G-204-B

QUESTIONS on TECHNOLOGY

by W. L. Nelson

Consulting Engineer

Chemical Composition Of Gasolines

What is the chemical analysis of gasoline? Which gasolines contain benzol hydrocarbons? F. A. C.

All gasolines contain some aromatic or benzene hydrocarbons, although synthetic gasolines (Fischer-Tropsch) usually contain less than about 7 per cent and usually under 5 per cent. This question was answered in our Questions on Technology of December 23, 1948, page 78, and a triangular coordinate chart was shown therein which is excellent for visually describing the chemical composition. Since that time, data on the composition of synthetic gasolines have become available in "Composition of a Synthetic Gasoline" by Clark and others, Ind. Eng. Chem., 41, 1527 (1949). These data along with those of the December 23, 1948, issue of The Oil and Gas Journal are summarized here in Table 1.

TABLE 1—COMPOSITION RANGES* OF GASOLINES, PER CENT

Kind of gasoline	Saturated‡	Unsaturated†	Aromatic
Straightrun:			
Regular	88-99	0-3	0-11
Rare crudes	77-88	0-4	11-22
Hydrogenation	85-94	0-10	5-9
Cracked:			
Thermal	50-74	11-40	6-22
Catalytic	50-80	10-30	4-23
Vapor phase cracked	42-48	45-50	16-22
Polymerization	19-25	60-70	6-20
Synthetic	3-15	85-92	0-7

*A few freak gasolines are not included. †Only a few samples. ‡Including 2.8-14.7 per cent of oxygenated compounds. §Paraffin, isoparaffin and naphthene. ¶Mainly olefins.

Butane as Engine Fuel

I am seeking literature on the conversion of gasoline engines to the use of butane—information on comparable costs, efficiency, and methods of conversion.—J. G. M.

The use of butane as an engine fuel involves so many details, many of a mechanical nature, that the situation cannot be discussed here. However, the following is a list of articles, etc., that pertain to the general subject. It would be necessary to work closely with the vendors of liquefied petroleum gases and the manufacturers of appliances. Some of the articles are old, but more detail is often given in earlier articles.

Anon., Propane Gas Engines for Caboose Power Supply for Radio Communication, Railway Mech. Engineer, December 1946, p. 675.

Anon., Butane as an Airplane Fuel, Natural Gasser, April 1941, p. 11.

Anon., Gain in Use of Butane as Truck Fuel in 1933 Giving Gasoline New Competition, Petroleum World, January 1934, p. 22.

Benz and Beckwith, Liquefied Petroleum Gases Boost Power and Cut Fuel Consumption, Auto. Industries, May 26, 1934.

Berger, L. B., Possible Hazards Attending Use of Engines Operated on Butane Fuel in Mining and Tunnel, U. S. Bur. Mines, Information Circ. 7284, May 1944.

Bignell, L. G. E., Normally Waste Product Successfully Used as Engine Fuel, The Oil and Gas Journal, July 11, 1935, p. 31.

Evans, E. W., Batch Vaporization of Butane-Propane Mixtures, Liquefied Petroleum Gas "Jet" (Phillips Petroleum Co.), Vol. 1, No. 3, 1939.

Finley, George H. (editor) Handbook of Butane Propane Gases, Second Edition, Western Gas, Los Angeles, 1935.

Friend, W. Z., Propane and Butane—Their Use and Limitations as a Motor Fuel, Bus Transportation, June 1943.

Friend and Brennan (A comprehensive article on propane operation of a power engine' Gas, March 1937.

Friend and Beckwith, Propane and Butane as Motor Fuels, J. Soc. Auto. Engs., January 1935.

Jamison, E. A., Butane and Propane as Tractor Fuels, Auto. Industries, October 1, 1947, p. 34.

Jones, E. H., Hazards and Use of Butane Discussed as Use for Fuel Engines Increases, Calif. Oil World, September 20, 1934, p. 12.

Kruttschnett, T. H., Butane Successful as Fuel for Rail Motor Cars, Western Gas, December 1933, p. 24.

Lady, Paul, Wildcat Oil Drillers Like Butane for Engine Power, Butane-Propane News, December 1945, p. 91.

Maher, J. F., Power from Butane, Power, February 1942, p. 132.

N.B.F.U. Pamphlet No. 58 Liquefied Petroleum Gases, Standards of the National Fire Protection Assoc., Nat. Board of Fire Underwriters, 222 W. Adam Street, Chicago.

Nelson, W. L., Hazards of Butane for Drilling Engines, The Oil and Gas Journal, May 14, 1942, p. 60.

Nelson, W. L., Utilization of Propane, The Oil and Gas Journal, November 25, 1944.

Ridder, H., Butane-Powered Trucks in Production at International's California Plant, Nat. Pet. News, January 22, 1947, p. 41.

Simons, H. F., Heater Is Essential Part of Butane Fuel System on Drilling Rigs, The Oil and Gas Journal, May 25, 1944, p. 77.

Smith, E., Engine Conversion, Butane Propane News, May 1940.

Smith, L. R., Advantages of Butane Over Gasoline and Steam Engines in the Oil Fields, Mining and Metallurgy, May 1937, p. 248.

Stockman, L. P., Use of Butane as Rail-Car Fuel Will Be Expanded on Southern Pacific Lines, The Oil and Gas Journal, June 7, 1934, p. 36.

Tattersfield, E. E., History and Future of Butane as a Motor-Truck Fuel, Journal S.A.E., August 1940, p. 331.

Tulsa Public Library, Technical Dept., A mimeographed list of articles on Liquefied Petroleum Gases (10 pages).

Weaver, E. R., Propane, Butane and Related Fuels, Circ. Nat. Bur. of Standards No. 420, 1938.

Spacing of Refinery Units

With regard to fire hazards, how close can refinery units be set?—F. M. C.

Aside from economic considerations and general topography, the spacings shown in Table 1 may be used. This table was taken from "Fire Protection in Refineries," Third Edition, 1941, of the American Petroleum Institute, and it is suggested that this excellent publication be consulted because of the large amount of other information is contains.

Units having the same general function are usually kept together in one general area. Within the area, the separate units are spaced apart for protection from each other. Likewise, the entire section or block is separated and protected from other similar areas.

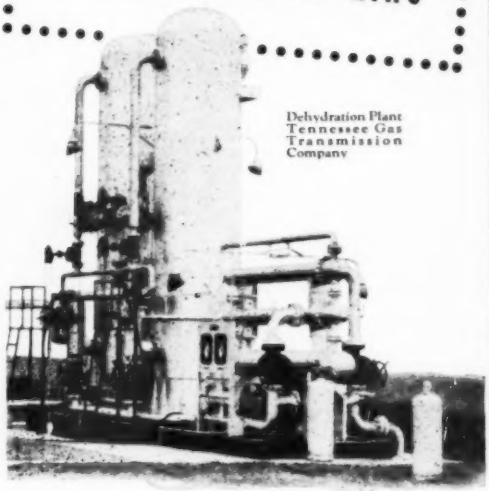
TABLE 1—SPACING OF REFINERY UNITS

Note: In case there is a conflict between spacings as shown below, the greater of the two distances applies.

From one item or unit—To another item or unit—	Distance, ft.
*Cracking unit (low pressure)—Cracking unit (setting to setting)	25 to 50
†Cracking unit (high pressure)—Cracking unit (battery to battery)	75 to 150
Cracking unit (either)—Pipe-still unit	separate block
Cracking unit (either)—Any other process unit	separate block
Pipe-still unit—Pipe-still unit (setting to setting)	25 to 50
Pipe-still unit—Any other process unit	100
Shell-still unit—Shell-still unit (battery to battery)	25 to 50
Steam-still battery (shell type)—Any other process unit	100
Condenser box—Shell-still unit	15 to 20
Receiving house—Running-tank fire wall	20
Treating unit (agitator)—Treating plant pump house	50 to 100
Boiler and power house—Any process unit	100 to 200
Oil-transfer pump house—Any process unit	50 to 100
Foam pump house—Any process unit	100 to 200
Main water pump house—Any process unit	100 to 200
‡Warehouse (oil storage)—Any process unit	50 to 100
Treating plant—Any process unit	100 to 200
§Gas plants—Any process unit	150 to 200
Gas holders—Any process unit	150 to 200
Main separator (covered)—Any process unit	50 to 100
Main separator (uncovered)—Any process unit	100 to 150

*Units operating at 350 psi. or less. †Units operating at over 350 psi. ‡This is meant to cover fireproof structures used for storing low-flash products, and includes sample storage and can-filling buildings. §This is intended to include plants such as gasoline-recovery, debutanization, stabilization, and absorption plants, when they are not an integral part of any process unit.

Florite
Dries Natural Gas on a Transmission Line



Dehydration Plant
Tennessee Gas
Transmission
Company

AN INTERESTING use of a Floridin product is that of the Tennessee Gas Transmission Company at a compressor station on its main line at East Bernard, Tex. Twin adsorption towers filled with Florite serve alternately to dehydrate gas from local sources before it is admitted to the main line. While one tower is active, the other is being reactivated by means of a heating unit and a heat exchanger; and thus uninterrupted service is maintained. A Bureau of Mines dewpoint instrument is used for checking the efficiency of the adsorption bed.

Floridin products, adapted to a wide range of advanced modern uses, include several specially prepared forms of . . . . . .

FULLERS EARTH

as well as two grades—refining grade and desiccant grade—of Florite, which is a . . . . . .

BAUXITE-BASED ADSORBENT

Your inquiry will be given careful attention.

FLORIDIN COMPANY

Adsorbents . . . Desiccants . . . Diluents

Dept C, 220 Liberty St., Warren, Pa.

CAST IRON JACKETS FOR REFINERY STEAM LINES

The photo shows 18-inch flanged cast iron pipe being installed to serve as jackets to protect insulation on an 8-inch high-pressure steam line at a refinery. Service rendered to the petroleum industry by cast iron pipe may not always be as spectacular but it is always reliable and economical.

No other pipe, at reasonable cost, offers comparable resistance to interior and exterior corrosion. Figured per service-year the direct economy of cast iron pipe is substantial.

Available with bell-and-spigot, plain end and flanged, or with standardized mechanical joints. Cast Iron Pipe Research Association, Thomas F. Wolfe, Research Engineer, 1015 Peoples Gas Bldg., Chicago 3, Illinois.

CAST IRON PIPE

FOR LONG LIFE AND ECONOMY

ENGINEERING fundamentals

No. 382

Equilibrium Constants

THE definition of an equilibrium constant has been stated in a previous Engineering Fundamentals as a prelude to applying phase calculations to petroleum-production problems. It was noted that the equilibrium constant is defined as k in the expression $y = kx$, where y is the mol fraction of a given component in the vapor phase of a mixture and x is the mol fraction of the same component in the liquid phase of the mixture. It was furthermore stated that the value of k depended upon the component being considered and that for a given component it was a function of pressure and temperature. The use of the equilibrium constant will now be outlined in a general fashion.

In applying the expression $y = kx$ to calculations on a mixture, other relations must also be taken into consideration. In any gaseous phase of a mixture, the sum of the individual mol fractions must equal unity. Expressed as a formula this is

$$y_1 + y_2 + y_3 + y_4 + \ldots y_n = 1.0 \quad (1)$$

Also, in the liquid phase of a mixture the sum of the mol fractions of the individual components must equal unity. The formula here is

$$x_1 + x_2 + x_3 + x_4 + \ldots y_n = 1.0 \quad (2)$$

Now if the gaseous phase under consideration exists in equilibrium with the liquid phase under considerations at a specified pressure and temperature, for each component in the mixture there will be a relation expressing the equilibrium, as follows:

$$y_1 = k_1x_1;\ y_2 = k_2x_2 \ldots y_n = k_nx_n \quad (3)$$

The above equations suffice to determine certain details about the phase properties of the mixture.

Discussion of Procedures

Assume, for example, that the gas from a mixture at a measured pressure and temperature is analyzed. The analysis gives y_1, y_2, y_3, y_4, etc. By reference to the proper equilibrium-constant charts values of k_1, k_2, k_3, etc. at the measured temperature and pressure are found. Therefore, x_1, x_2, x_3, x_4, etc. can be calculated from Equation 3. However, Equation 2 must be satisfied. If the calculated values of x_1, x_2, x_3, x_4, etc. do not add up to unity it must be assumed that the gas which was analyzed was not in equilibrium with the liquid in the mixture at the temperature and pressure measured.

Assume, as a second case, that the pressure and temperature are measured on a system which has been allowed to come to equilibrium. Gas is withdrawn from the system. The values of y are obtained by analysis of the gas and they are multiplied by the corresponding k values to give x values. If the latter do not add up to unity, it can be assumed that there were not two phases present in the system because it was assumed that the system was known to be at equilibrium. Thus, the system contains only the gas whose properties were measured.

General Case, Phase Rule

Assume, as a general case, that the pressure and temperature are measured on a system in equilibrium but that two phases are known to exist in the system. The k values for use in Equation 3 are therefore known by reference to the proper equilibrium constant charts. All the y values of Equation 1 and all the x values of Equation 2 are unknown, a total of 2n unknown quantities. There are n separate equations under Equation 3 and Equations 1 and 2 also apply, so there are a total of $n + 2$ equations. Inasmuch as there are 2n unknowns but only $(n + 2)$ equations, $2n - (n + 2)$ of the unknowns must be fixed before the remainder of the unknowns can be found. This is equivalent to $n - 2$ unknowns that must be fixed. For example, this would be $(n - 2)$ of all values of y or $(n - 2)$ of all values of x.

The concept outlined in the preceding paragraph is more generally stated as the phase rule, written generally as, (Number of phases) + (Number of variables to be fixed) = (Number of components) + 2.

In this particular case discussed, two phases were assumed. Therefore the number of variables to be fixed would be equal to the number of components, of which there are n. Pressure and temperature are two of the variables, however. It was assumed that these were known, which leaves $n - 2$ variables to be fixed. The only possible variables aside from pressure and temperature are the relative amounts of the components that exist in the two phases, i.e., values of y or x.

In a two-component system, for example a mixture of propane and butane, the phase rule would give

Number of phases + number of variables to be fixed = 4

If two phases, gas and liquid, exist in the system then the number of variables to be fixed are two. These could be pressure and temperature, or they could be the mol fraction of a given component in the vapor and liquid phase. In other words, one could give the pressure and temperature on the system and calculate therefrom x_1, x_2, y_1, and y_2; or one could give y_1 and x_1 and calculate therefrom the pressure and temperature.

Series by Dr. John C. Calhoun, Jr., Chairman, Petroleum Engineering School, University of Oklahoma

N.B. While it is axiomatic that return on investment—the *ultimate earning* power of a refinery unit when actually on stream—is the only true evaluation of competitive engineering recommendations, initial plant costs remain a major factor in refiners' decisions on plant installations. M. W. Kellogg takes specific steps to *minimize initial plant costs* consistent with the achievement of *highest ultimate earning* power.

HOW WATCHING AN ANGLE CAN SAVE $20,000

Watching an angle, in this instance, concerns a main vessel and the saving is not in steel, pipe or concrete. Of all things, it is in the cost of derrick operations.

Most refiners know that Kellogg was the first to utilize gigantic, 150-ton-lift, centrally-located, guy derricks in refinery construction, a practice common in the industry today. However, probably few refiners give much thought to the fact that the ability of these derricks *to lift* varies with the distance the object to be lifted is from the base of the derrick and, therefore, with the *angle* of the boom.

But that's an important point to remember in refinery engineering—to forget it can cost appreciable amounts of money. For instance, most refinery jobs embrace a half dozen or more major lifts in connection with placing vessels. If, because of some minor oversight in the original planning, any one of them is incorrectly located—even as little as a foot outside the possible lifting radius of the guy derrick—there is an extra item to go into the cost sheet for special rigging. It may run as high as $20,000.

That's one reason why, at Kellogg, plot plans are created jointly by the Engineering and Construction groups . . . why many other phases of refinery building—structural steel, foundations, insulation, buildings to specify but a few—are designed through close collaboration between these two groups.

Only through the integrated efforts of several types of specialists *in the design phase*, can the little design "bugs", which cost refiners extra sums on the construction lot, be removed with an eraser. Further, such basic economy is only possible when *all* specialists concerned are constantly available for easy consultation so that checks and balances are automatically applied at the proper time. That, Kellogg believes, is the only true approach to LOW INITIAL COSTS.

THE M. W. KELLOGG COMPANY
A SUBSIDIARY OF PULLMAN, INC.

ENGINEERS TO THE PETROLEUM INDUSTRY

NEW YORK JERSEY CITY LOS ANGELES TULSA HOUSTON TORONTO LONDON PARIS

Cost-imating

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL

Refinery Valves

TENTATIVE SCHEDULE OF TOPICS

No. 40—July 21—1949 Cost Indexes
No. 41—July 28—Pipe-Still Frames
No. 42—Aug. 4—Pipe and Tubing
No. 43—Aug. 11—Chemical Equipment—I
No. 44—Aug. 18—Pipe-Line Construction
No. 45—Aug. 25—Valves
No. 46—Sept. 1—Fittings and Flanges
No. 47—Sept. 8—Chemical Equipment—II
No. 48—Sept. 15—Piping
No. 49—Sept. 22—Vacuum Equipment

SUCH a wide variety of valves are employed that only the gross approximation shown in Fig. 1 can be suggested. Note that prices range by about plus or minus 40 per cent, but also note that the range is not due to inadequate data but to the naturally wide variety of valves that are utilized. Thus, there are plug, gate, and globe valves; there are iron, steel, cast iron, and ferrosteel valves; there are screwed and flanged connections; and a wide variety of trim (stem and seats) is offered. Only the valves normally employed in refinery service are considered in Fig. 1, and this accounts to a large extent for the fair consistency exhibited. Thus, it behooves the cost estimator to be familiar with the types of valves used for each service so that he can select high or low values from Fig. 1. Stainless-steel trim almost doubles the costs shown in Fig. 1, and stainless linings or bodies are even more expensive.

Incidentally, more detail than that given in Fig. 1 is not justified because it would defeat the purpose of preliminary cost estimating, namely, to provide a quick and cheap method of obtaining a reasonably accurate cost. More detail in the costing of valves (also piping and fittings) would require detailed drawings of the piping system, and such drawings are not ordinarily available to cost estimators.

TABLE 1—APPROXIMATE COST (1946) OF DIAPHRAGM CONTROL AND RELIEF VALVES (DOLLARS EACH)

Size (in.)	Diaphragm control*	Relief†
½	75	
1	90	55
1½	115	90
2	135	120
3	185	190
4	245	280
6	360	460
8	480	

*Costs vary by plus or minus 35 per cent. †Costs vary by plus or minus 50 per cent—the highest costs for 1,500 lb.

Many of the data came from the author's files, although Happel, Aries, and Borns (Chem. Eng., October 1946, page 99) and Tyler, C., Chemical Engineering Economics, Third Edition (McGraw-Hill Book Co., Inc., New York, 1948) were employed and they contain much detail information. The information of C. E. Miller (Chem. and Met., May 1937, page 269) appears to be installed costs rather than material costs.

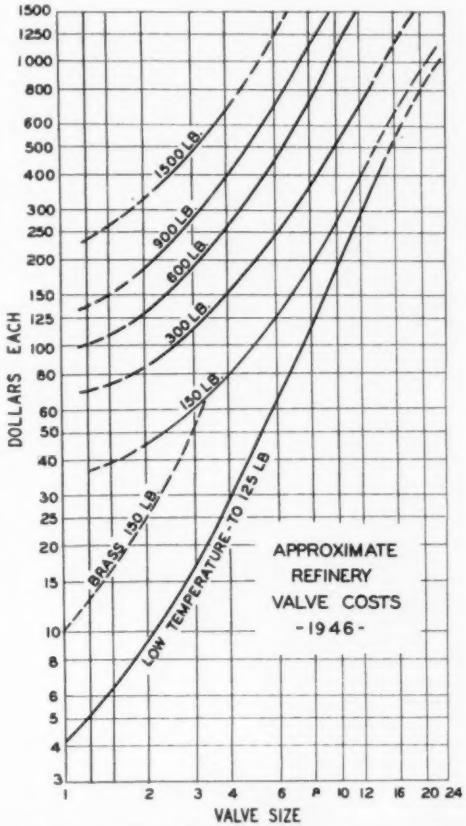
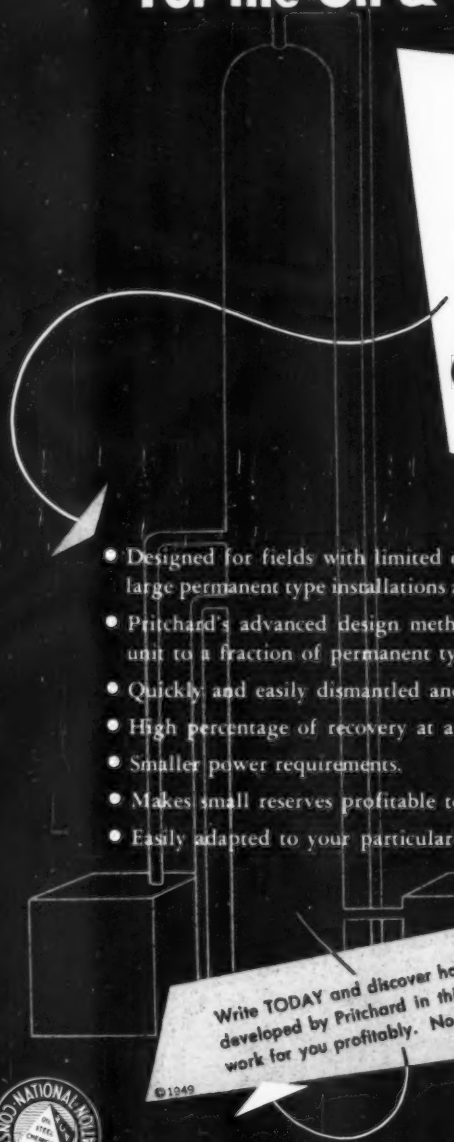


Fig. 1—Approximate 1946 costs of valves used in petroleum services. Prices vary widely, about plus or minus 40 per cent

No. 45 in a series by W. L. Nelson, professor of petroleum refinery engineering, University of Tulsa

PRITCHARD *Leads Again* to Design

For the Oil & Gas Industry



the NEW *Trans-Portable* LEASE UNIT GASOLINE EXTRACTOR *and* TREATER

- Designed for fields with limited or uncertain reserves, where large permanent type installations are economically unjustified.
- Pritchard's advanced design methods reduce the cost of this unit to a fraction of permanent type units.
- Quickly and easily dismantled and transported to other sites.
- High percentage of recovery at a fraction of former costs.
- Smaller power requirements.
- Makes small reserves profitable to process.
- Easily adapted to your particular extraction requirements.

Write TODAY and discover how the advanced design methods developed by Pritchard in this extraction plant can be put to work for you profitably. No obligation, write TODAY!

©1949

NATIONAL PIPE CONSTRUCTORS ASSOCIATION MEMBER

PETROLEUM DIVISION

J.F. Pritchard & Co.

DESIGN · ENGINEERING · CONSTRUCTION

900 GRAND AVE. · KANSAS CITY 6, MO.

NEW YORK · CHICAGO · LOS ANGELES · HOUSTON · PITTSBURGH · ST. LOUIS · TULSA

REFINING

Work on Panhandle's Plant Stopped by Labor Dispute

A shutdown was caused last week on construction work at Panhandle Producing & Refining Co.'s Wichita Falls, Tex., refinery project, by a dispute between workers of two labor unions. Approximately 150 men were idled following the placing of pickets from Iron and Steel Workers Union No. 592.

Dispute arose over division of work between members of that union and workers belonging to Boilermakers Local 96, a Fort Worth unit, according to Paul Criswell, business agent for the iron and steel-workers union.

The shutdown affected all workers on the new building under construction as part of a $1,000,000 project for expanding the refinery's facilities for production of high-octane gasoline. Work started in June and was scheduled for completion in January 1950.

Bechtel Awarded Contract For Salt Lake Cracker

Salt Lake Refining Co., subsidiary of Standard Oil Co. of California, has awarded a contract to Bechtel Corp. for design and construction of a new multimillion-dollar catalytic cracking plant at Salt Lake City, according to G. E. Finney, Jr., president of the refining company.

The catalytic unit will be part of the new $10,000,000 expansion program of the firm. It is expected to be in operation by the end of 1950.

Finney said the cracking plant will boost the processing capacity of the refinery and increase the plant's output of high-octane gasoline, heating oils, and diesel fuels.

The new cat cracker will be fed straightrun waxy gas oil from the refinery's existing crude unit. Its rated capacity is 10,000 bbl. per stream day, from which it will make approximately 4,000 bbl. cracked gasoline.

Other new plant facilities, either planned or now under construction, include additional tankage and lines, storehouse, booster-pump station, cooling tower, and boiler plant.

Negotiations Under Way on Crown Central Plant Strike

Negotiations were reported under way last week between management of Crown Central Petroleum Corp.'s refinery at Pasadena, Tex., near Houston, and Oil Workers International Union (C.I.O.), Local 227.

The plant closed in mid-July following writing of grievances by employes on company time, which the company claimed disrupted operations and made safe operation impossible.

Pickets placed around the refinery halted work at its bulk plant only recently, that portion of the installation having remained open after the shutdown.

Registration for Corrosion Short Course Under Way

Official applications for registration at the University of Texas Short Course in Corrosion are now being sent out by the central office of National Association of Corrosion Engineers. The course will be held in Austin September 12-16.

Included in the course will be studies on fundamentals, metallurgy, types of corrosion, corrosion-resistant metals, protective coatings, cathodic protection, and chemical treatment.

Among lecturers will be F. A. Prange, Phillips Petroleum Co., Bartlesville, who will discuss metallurgy; Frank LaQue, International Nickel Co., Inc., New York City, who will describe corrosion-resistant metals; A. W. Peabody, Ebasco Services, Inc., Jackson, Miss., who will report on cathodic protection, practical aspects; Scott P. Ewing, Carter Oil Co., Tulsa, who will discuss cathodic protection, theoretical aspects; L. G. Vande Bogart, Crane Co., Chicago, who will outline types of corrosion; and Dr. Norman Hackerman of the university, who will discuss fundamentals.

Refinery Fire Marshals Aiding in Safety Records

The Refinery Fire Marshals, an organization sponsored by National Petroleum Association, has aided materially in helping reduce fires and injuries to personnel in refineries over the nation, and in helping these plants to establish safety records.

The national organization is made up of local groups, which meet regularly and go through refineries, inspecting for all possible fire and accident hazards. The groups are made up of representatives from various company refineries, and members inspect each other's installations.

AMMONIA
(REFRIGERATION GRADE)

DIRECT SERVICE
FROM
PRODUCING POINT
TO USER IN

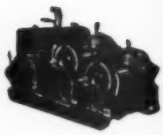
TANK CARS
and
CYLINDERS

Discuss contract
shipments or
spot orders with

SPENCER
SPENCER CHEMICAL COMPANY
Executive & Sales Offices: Dwight Bldg., Kansas City 6, Mo.

LEADING CONTRACTORS PREFER
Sterling
PUMPS • HOISTS • LIGHT PLANTS

SIMPLE
RUGGED
DEPENDABLE
•
EASY TO
OPERATE
•
DO MORE
WORK AT
LESS COST
•
WRITE FOR
CATALOG
TODAY



STERLING
MACHINERY CORPORATION
405-13 SOUTHWEST BLVD. KANSAS CITY 10, MO.

Save Petroleum

McMURRY
Relief Valve

Effectively Eliminates all leaks in pipelines due to Thermal Expansion.

No costly installation, simply replace present Disc with McMurry Relief Valve Disc.

Write for full information to

PAUL McMURRY
6208 Washington, St. Joseph, Mo.

Socony-Vacuum Puts New Treater in Operation

The Lubrite division of Socony-Vacuum Oil Co., Inc., is now operating a new Tannin solutizer treating unit with a capacity of 20,000 bbl. daily. The unit is designed to handle all light oil treating.

A 15,000-bbl. thermal cracking, reforming, and visbreaker unit with a capacity of 15,000 bbl. daily will be completed in December, along with miscellaneous additions to the refinery's facilities. A crude-distillation unit is scheduled to be completed in September with a capacity of 20,000 bbl. daily and a delayed-coking unit now under construction with a capacity of 8,700 bbl. daily is scheduled for completion after the first of the year.

These are parts of a general modernization and enlargement program at the East St. Louis, Ill., refinery which started last year. The Bechtel Corp. is in charge of construction.

Southwestern Refinery at Corpus Christi Reopened

Southwestern Oil & Refining Co.'s refinery at Corpus Christi has resumed partial operation after several months of shutdown due to low product market prices.

S. S. Seltzer, president of Royal Petroleum Co., affiliate of Southwestern, said that full-scale capacity will not be sought because "refining operations at the Gulf are unprofitable as long as cargo price for No. 2 oil remains below 7.5 cents per gallon."

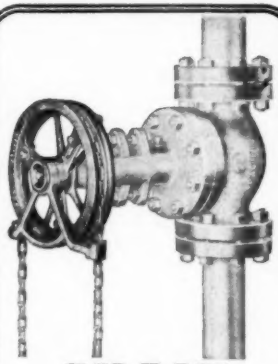
Symposia to Be Featured At October A.S.T.M. Meet

American Society for Testing Materials has arranged two symposia of interest to those concerned with petroleum at the national meeting in San Francisco October 10-14.

The symposia cover high-additive-content oils and turbine oils and are scheduled for October 12, under auspices of Committee D-2 on petroleum products and lubricants. During the week, the committee is scheduling numerous technical committee meetings and several other A.S.T.M. committees will meet.

The symposium on high-additive-content oils will feature three papers and two discussions, including: "Does Service Performance Justify Higher Quality Lubricating Oils," by W. B. Bassett, Lubrizol Corp., Cleveland; "High-Detergency Motor Oils," by A. B. Boehm, Enjay Co., and C. O. Tongberg, Standard Oil Development Co., New York; and "Possible Future Military Engine Oils," by N. L. Klein, Office of Chief of Ordnance, Department of the Army, Washington, D. C.

The symposium on turbine oils will include four papers: "Operating Experience and Problems Relative to Lubricating Systems of Steam-Turbine Sets for Utilities," by V. Estcourt, Pacific Gas & Electric Co., San Francisco; "Specific Problems Pertaining to Lubrication of Industrial Turbines," by T. N. Bath, Shell Oil Co., New York; "Lubrication of Marine Turbine-Propulsion Equipment," by F. S. Jones, Socony-Vacuum Oil Co., Inc., New York; and "Lubrication Requirements of Gas-Turbine Equipment," by F. C. Linn, General Electric Co., Schenectady, N. Y.



CHAIN
WHEELS

TO OPERATE THOSE HARD TO REACH, OVERHEAD VALVES--TRY CHAIN WHEELS.

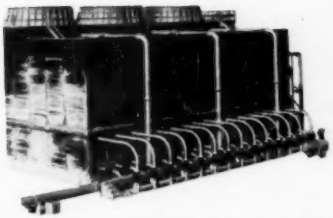
Pacific's, low cost, Universal Type can be quickly attached to the rim of the Valve's handwheel--ready to work in a few minutes. Available in sizes to fit handwheels from 2" to 26" in diameter. These heavy duty chain wheels are cast of strong gray iron and their chain guides (furnished with all wheels) are cast of malleable iron.

Write for additional information and prices stating the amount of chain required.

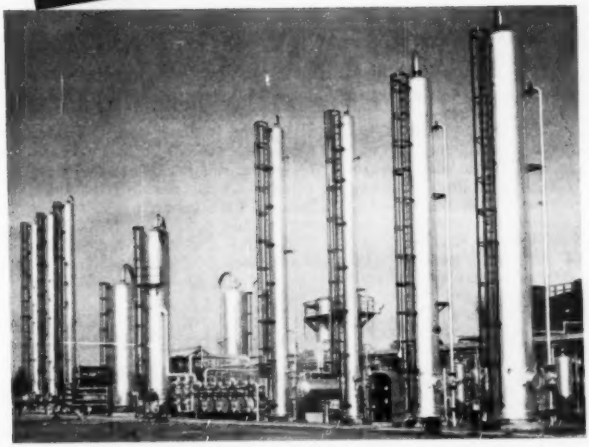
PACIFIC VALVES, INC.
3201 WALNUT AVE., LONG BEACH 7, CALIF.
TELETYPES: L.B. 9-0878 N.Y. 1-1077

INDUSTRIAL
OIL AND GAS
BURNING
EQUIPMENT
NATIONAL AIROIL
BURNER CO., INC.
1236 East Sedgley Avenue, Philadelphia 34, Pennsylvania
Texas Office: 2512 South Boulevard, Houston 6

CONTROL
Scale and Corrosion



in Cooling Towers, Compressors, Engine Jackets



Wherever WATER is used in the Petroleum Industry there is need for WRIGHT CHEMICALS to protect equipment from scale and corrosion. Wright Chemicals are specifically formulated for individual applications.

There is a Wright Field Engineer near you to help with your water-conditioning problems.

Wright CHEMICALS

WRIGHT CHEMICAL CORPORATION

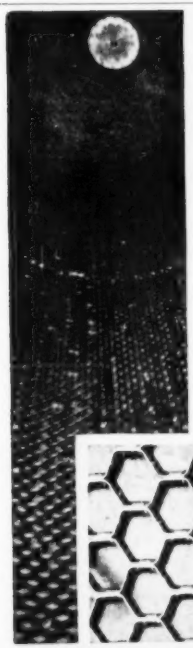
Specializing in Water Conditioning

GENERAL OFFICE AND LABORATORY

615 West Lake Street, Chicago 6, Illinois

OFFICES IN PRINCIPAL CITIES

SOLE DISTRIBUTOR OF NELSON CHEMICAL PROPORTIONING PUMPS



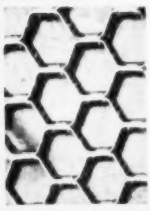
cut to YOUR size
ready to install

KLEMP HEXTEEL

— most *practical* reinforcement for gunite and ganister lining.

Each section of KLEMP Heavy-duty Hexteel Open Steel Armor is cut to your special specifications for a perfect fit. Ready for installation in ¾", 1" or 1¼" no. 12 or 14 gauge steel mesh.

The flexibility and "custom-fit" economy of KLEMP Hexteel make it the most practical installation for holding the protective coating in your soaking chambers, fractionating towers and other processing equipment. Millions of square feet in use.



WRITE TODAY FOR MORE COMPLETE DETAILS

Ask, too, for information about KLEMP Open Steel Gratings and KLEMP Floorsteel, flexible floor armor that rolls out like a rug.

UPPER LEFT

Hexteel Armor Reinforcement installation in 6-ft. I.D. Fractionating Tower.

LEFT

Section of Hexteel held to wall by direct weld.

KLEMP — SURE FOOTED AS A CAT — HEXTEEL — Heavy Duty Surface Armor

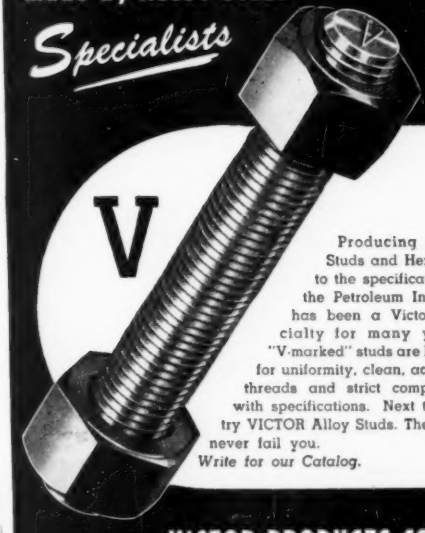
WM. F. KLEMP COMPANY

6638 S. MELVINA AVE. CHICAGO 38, ILL.

Offices: 414 Esperson Bldg., Houston, Texas; Graybar Bldg., New York, N. Y.

VICTOR STUDS...

made by ALLOY STEEL *Specialists*



Producing Alloy Studs and Hex Nuts to the specification of the Petroleum Industry has been a Victor specialty for many years. "V-marked" studs are known for uniformity, clean, accurate threads and strict compliance with specifications. Next time — try VICTOR Alloy Studs. They will never fail you.

Write for our Catalog.

VICTOR PRODUCTS CORP.

2635 Belmont Ave. KEystone 9-5940 Chicago 18, Ill.

NATURAL GAS

Proposals to Supply Gas To Virginia Consolidated

Three applications to construct and operate pipe-line facilities to transport natural gas to markets in Virginia have been consolidated by Federal Power Commission, and a hearing set for September 14 in Washington, D. C.

The three applications, filed by Commonwealth Natural Gas Corp., Virginia Natural Gas Co., and Piedmont Natural Gas Corp., all propose, among other things, to transport and sell natural gas for resale in Richmond and Norfolk.

Commonwealth's amended application, filed last month, sets forth plans for a 200-mile pipe line which would extend fom a point of connection with Virginia Gas Transmission Corp.'s pipe line, probably in Green County, Virginia, in a southeasterly direction to the vicinity of Norfolk. The firm listed its prospective customers as Petersburg & Hopewell Gas Co., Virginia Electric & Power Co., Portsmouth Gas Co., Suffolk Gas Co., and the cities of Richmond and Charlottesville. The company also plans to serve the Solvay Process Division, Allied Chemical & Dye Corp. in Hopewell.

Virginia Natural, which also filed its application in July, proposes to build a 153-mile line in Virginia extending from near Buckingham on the Texas-New York City pipe line now being built by Transcontinental Gas Pipe Line Corp., and running southeasterly to the Norfolk area.

Piedmont, in an amended application filed in April, proposed to construct a 1,290-mile line extending from Gulf Coast fields of Texas and Louisiana into southeastern Virginia to a point where two pipe lines would diverge, with one extending to Richmond and the other to Norfolk. It also plans to serve the Piedmont region of the Carolinas.

Hearing September 7 On Jersey Central's Proposal

Federal Power Commission has scheduled a hearing in Washington, D. C., September 7 on Jersey Central Power & Light Co.'s proposal to construct a 39.4-mile natural-gas pipe line in New Jersey connecting the company's coast division system with Texas Eastern Transmission Corp.'s Big Inch line. The proposed line would cost $1,208,200.

If granted permission, the company would connect the line with the Big Inch line near Bound Brook, N. J., and extend it southeastward to Jersey Central's gas-manufacturing plant in Long Branch. Natural gas received from Texas Eastern would be mixed with manufactured gas at the Long Branch plant for distribution in Monmouth and Ocean counties. Texas Eastern previously was ordered by FPC to deliver up to 5,000,000 cu. ft. of natural gas daily to Jersey Central.

Residents of New York City's Staten Island are now being supplied with natural gas from both the Big Inch and Little Inch lines of Texas Eastern. Mayor William O'Dwyer last week officially turned a gate valve at New York & Richmond Gas Co.'s plant which linked approximately 38,000 customers of the company with a natural-gas supply for the first time.

Public Service Gas & Electric Corp., which serves the Bayonne, N. J., area, has also contracted to purchase gas from Texas Eastern.

FPC Is Investigating Mondakota Gas' Complaint

Hearing was started in Washington, D. C., last week by Federal Power Commission in an investigation of the complaint filed by Mondakota Gas Co., alleging that Montana-Dakota Utilities Co. has failed and refused to perform "common carrier" natural-gas transmission service in accordance with the common-carrier rate schedule previously filed with the commission.

Mondakota filed its informal complaint last month and Montana-Dakota subsequently replied, stating its willingness to transport natural gas over its interstate transmission pipeline system in accordance with its tariff, but that Mondakota desired service from a distribution line which was not covered by its tariff.

Montana-Dakota, as an operator of a pipe-line system extending across public lands of the United States, is required by an act of Congress to perform common-carrier service in accordance with permits issued by the secretary of the interior.

FPC in 1946, following a proceeding involving the same two companies, directed Montana-Dakota to establish reduced rates for common-carrier transportation of natural gas. The commission's order was affirmed by the U. S. Court of Appeals for the Eighth Circuit and the Supreme Court of the United States refused further review. That proceeding was instituted by FPC following a complaint by Mondakota alleging that Montana-Dakota's common-carrier rates were discriminatory.

Shell Arranges for Gas Outlet in Elk City Field

Shell Oil Co., Inc., has consummated an arrangement with Consolidated Gas Utilities Corp., providing for the sale of natural gas from Elk City field in Beckham and Washita counties in southwestern Oklahoma, according to W. A. Alexander, Tulsa area manager.

Under the agreement, Consolidated will construct a 12¾-in. natural-gas line from its Carpenter station, located on its main transmission line 14 miles northeast of the field, to a point where gas will be delivered from a field-gathering system to be constructed by Shell.

The line and gas-gathering system are expected to be in operation before the end of this year.

New Yearbook Issued

American Gas Association has mailed to its members the 1948 edition of "Gas Facts," a new statistical record of the gas-utility industry, which gives location and extent of the major interstate natural-gas pipe lines, with their operating statistics up to the end of 1948. Copies are available to interested nonmembers at $1 each and may be obtained from A.G.A.'s headquarters at 420 Lexington Avenue, New York City.

Natural Gasoline

University of Pittsburgh Site of L.P.G. Classes

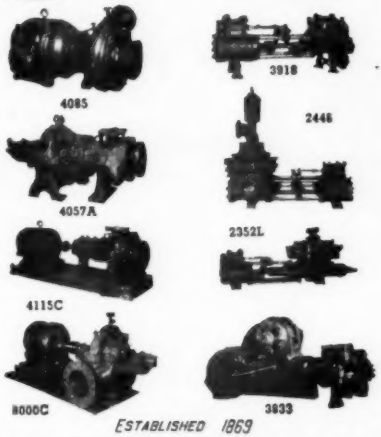
Three days of concentrated and practical instruction for servicemen and others in the liquefied petroleum gas industry will be offered in the second annual Eastern L.P.G. Service School which opens at the University of Pittsburgh, September 7. Sponsored and conducted by the Liquefied Petroleum Gas Association, the sessions will be open to everyone in the L.P.G. business.

Combining lectures by leading authorities with demonstrations and question and answer periods, the school is designed to give new employes of the industry an insight into the fundamentals of L.P.G. operations, to serve as a refresher course for veterans in the business, and as a means of bringing all up to date on the latest technical, service, and commercial developments.

PUMPS

CENTRIFUGAL
RECIPROCATING

BUILDERS OF OUTSTANDING PUMPS
Since 1869



ESTABLISHED 1869

DEAN BROTHERS PUMPS INC.
INDIANAPOLIS IND.
323 W TENTH ST.

THOMPSON-HAYWARD

FORMALDEHYDE

for corrosion control

You can protect your casings, rods, and all exposed metal parts for only a few cents a day. You can

- SAVE ON PULLING COSTS
- SAVE ON NEW STEEL
- SAVE ON SHUTDOWN TIME

Thompson-Hayward Formaldehyde gives dependable protection from hydrogen sulphide corrosion and corrosive mine and well waters.

Write our nearest office for detailed information •

THOMPSON-HAYWARD CHEMICAL CO.

Dallas Houston Denver
Wichita Tulsa San Antonio
New Orleans

(B)

NOW... cut low-pressure orifice meter maintenance costs as much as 60%

with the new LOW-PRESSURE
SQUIER AUTOMATIC ORIFICE METER
BEARING-SHAFT LUBRICATOR

John P. Squier Co. announces the availability of a new Automatic Bearing-Shaft Lubricator (Model 75) designed especially for installation on low-pressure wet gas purchase meters operating up to 750 p.s.i.

Designed with the identical "sustained pressure" lubrication principle used in the highly successful Squier High-Pressure Lubricator*, the Model 75 protects expensive replacement parts, assures accurate leak-proof bearing-shaft operations, and guarantees maximum sensitivity which invariably allows pen to return to normal position.

*Model 525 – for bearing-shaft lubrication in orifice meters operating under pressures up to 5000 p.s.i.

MODEL 75
(750 p.s.i. working pressure) costs only $10 – quantity price.

Low purchase price makes the Model 75 ideal for use in multiple low-pressure orifice meter installations. Hundreds of Squier Lubricators now in the field are cutting meter maintenance costs from 40 to 60%.

free descriptive literature gives complete construction and operating details, field performance data, etc. Locations of Squier Lubricators now in actual use furnished upon request.

NAME_____

ADDRESS_____

CITY_____ STATE_____

MAIL TO
John P. Squier Company, P. O. Box 6100, Dallas, Texas

JOHN P. SQUIER CO.

- Gas Pipe Line Construction
- Oil Lines
- River Crossings
- Gas Gathering Systems
- Oil Gathering Systems
- Products Pipelines

R. H. FULTON & COMPANY

CONTRACTORS

Phone 5231 Lubbock, Texas Box 1542

PIPE LINES

Stanolind Working On Six Pipe-Line Projects

STANOLIND PIPE LINE CO., Tulsa, is currently working on six pipe-line projects, including an extension of the company's trunk-line system from Salt Creek to the new Sussex field in Wyoming. All are in various stages of planning, or are under construction at this time.

On August 5 Wyoming Public Service Commission heard the company's unopposed application for a certificate of convenience and necessity, and a certificate was granted to extend a line north from Salt Creek, in Natrona County, into Johnson County, Wyoming. The extension will consist of 4,000 ft. of 4-in. line, 4 miles of 6-in., 14 miles of 8-in., and a 35 hp. pumping unit. Bids for construction by contractors were to be returned to the company by August 15 with construction to start quickly and be completed within 30 days in order to have the job finished before winter.

The new line will run almost directly north from Salt Creek station about 7 miles into Johnson County. There a permanent pump station will be established and the line will turn east across Meadow Creek to Continental Oil Co.'s producing area in the Sussex field. The area now has 5 producing wells, averaging from 200 to 250 bbl. a day from 3 different sands, and another is being drilled. American Liberty Oil Co. also is interested in this area.

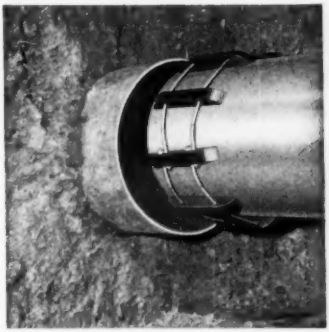
Stanolind Pipe Line has transported Wyoming crude oil to midwestern refining centers since 1923. The company's system traverses the state from Elk Basin, near the Montana line, through Casper to the Nebraska line near Mitchell, Neb. It continues east to Freeman, Mo., to a junction with the company's Gulf Coast-Chicago lines. The Wyoming portion of the company's system is the only pipe-line link between the Rocky Mountain area and midwest refineries and can move more than 50,000 bbl. of crude oil daily.

Two projects are planned for Texas: In the Dean area of the Levelland pool, Cochran County, a gathering system is planned which will consist of 6,100 ft. of 3-in. line, 37,500 ft. of 4-in. line, one 25 hp. and two 8.5 hp. pumping units.

In Jack County, in the Post Oak and Avis areas, an extension and

This section of pipe for Transcontinental Gas Pipe Line Corp.'s 1,840-mile Texas-New York 30-in. line is being lowered into position, after having first been given a final protective coating. The company reports that good progress is being made on the line, which will provide natural-gas service for the Northeast. Pipe was made by Consolidated Western Steel Corp. at Los Angeles

PROTECT YOUR PIPE LINE with Williamson Pipe Line CASING INSULATORS*



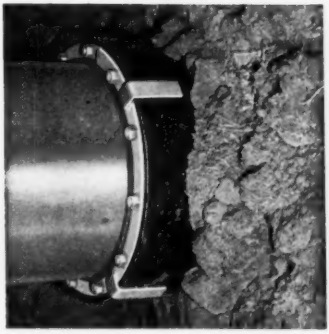
This device—simple, rugged, economical—supports and guides the leading end of coated line pipe into the right-of-way casing under railroads and highways.

Additional Casing insulators, clamped around the pipe every 20 to 30 feet, serve three purposes:

1—To protect the pipe coating.
2—To act as pipe skids, facilitating installation.
3—To separate pipe and casing, assuring permanent insulation for cathodic protection.

•

WmSEAL CASING BUSHINGS*



Equipped with exclusive T-gasket for positive watertight seal and insulation of pipe from steel flanges, this improved "casing seal" is designed for easy installation at each end of pipe-line casing under right-of-way crossings.

WmSEAL Casing bushings are readily installed because they offer:

- Large center hole for loose fit around coated pipe.
- Generous clearance inside of casing before bolts are tightened.
- Easily opened after removal of only one bolt, for closing around installed pipe line. WmSEAL Casing Bushings are widely used as wall sleeves for valve boxes, manifolds, etc.

*Patents Pending

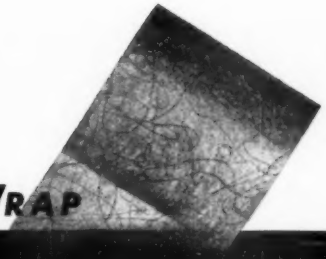
THE PIG WITH THE POKE CLEANS PIPE LINES

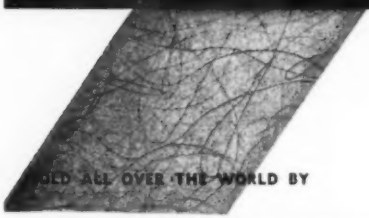
T. D. Williamson, Inc.
TULSA 9, OKLAHOMA

Vitron*

GLASS FIBER

UNDERGROUND PIPE WRAP





SOLD ALL OVER THE WORLD BY

M. J. CROSE

MANUFACTURING CO., INC.

2715 Dawson Road, Tulsa, Okla.

Houston — New York — San Francisco

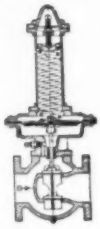
PERMANENT PIPE LINE PROTECTION!

- Reinforces the pipe coating.
- Retards cold flow in coatings.
- Increases impact strength of most pipe coatings.
- Will not absorb moisture — Glass Fiber is non-hygroscopic.
- Inert to soil chemicals.
- Hy-tensile and tear strength of mat results in simple uniform application.
- Excellent saturation characteristics with all types of pipe coatings.

WRITE FOR BULLETIN NO. V-69

* *Manufactured by GLASS FIBERS, INC., Waterville, Ohio*

SEALED FOR SAFETY!



The Davis No. 331S Field Regulator

SEALED against unauthorized resetting and against the erosion of weather, the Davis No. 331S spring-loaded Field Regulator gives real control on outdoor gas-gathering systems. Compact, rugged construction is similar to the well known Davis No. 330W weight-loaded Regulator. Built-in by-pass steadies valve action and prevents vibration. Can be adjusted for vacuum or back pressure service in the field. Get full details today. Write for Bulletin.

DAVIS REGULATOR COMPANY
2543 S. Washtenaw Ave., Chicago 9, Ill.

Distributor: Westcott & Greis, Tulsa, Dallas and Houston

DAVIS REGULATOR COMPANY

Safety

Load Binder

This load binder has been in use by oil companies, highway department and private truck operators for several months and in every case has proven highly satisfactory. Its use will eliminate the practice of using the old dangerous and hazardous "CHEATER".

Built for Oil Field Service
Tighten without dis-engaging hooks
Strength in heat treated steels
Ease of operation
Durability of parts

Pat. Pend.

Hook used for installing new chain on rotary drilling equipment

Contact Your Supply House or

FRANK MATHEY

MACHINE WORKS INC.

114 So. Elgin TULSA, OKLA. Ph. 2-9375

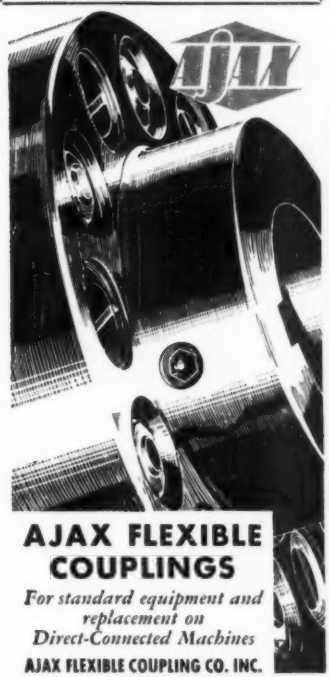
Two joints of 30" pipe welded together to form a length 62' long, shown in the final Bending Stage in the "Cinch" Bender. Note how the pipe was bent continuously through the Welded Joint. This demonstration established firmly, quality on an Economical Basis.

Makes Bending a Cinch

THE COODY BENDER CO.

P. O. Box 9271, Central Park Station

HOUSTON, TEXAS



AJAX FLEXIBLE COUPLINGS

For standard equipment and replacement on Direct-Connected Machines

AJAX FLEXIBLE COUPLING CO. INC.

18 English St.

WESTFIELD, NEW YORK

gathering system is planned that is scheduled to be completed by September 1. This consists of 2 miles of 4-in. line, 12 miles of 6-in. line, a 2,000 bbl. tank, a 90 hp. pumping unit and a 30 hp. pumping unit. Contract for this job was awarded to I. C. Little Construction Co.

The Jack County gathering system will serve the Post Oak pool recently opened by Mid-Continent Petroleum Corp. and a second area opened by Mid-Continent 1½ miles southeast of the Post Oak pool. Completion of the line will allow speeded development of the Ellenburger and conglomerate areas of northeastern Jack and northwestern Wise counties, most active sectors in North Texas. The new line will join Stanolind's Gulf Coast- Chicago line near Jacksboro, Tex.

Another planned project is in New Mexico. In the BTA field in Lea County, the company proposes to build a gathering system comprising 4.4 miles of 6-in. and 4.7 miles of 4-in. line.

The New Mexico system will tie in with the company's West Texas trunk line. Stanolind's trunk lines in this area run from Wheeler County, through Slaughter to Drumright, Okla., for a junction with the Gulf Coast-Chicago lines.

Water repressuring of old wells in the Lenapah area of Nowata County, Oklahoma, has improved production. The company will construct a system consisting of 27,000 ft. of 4-in. line and a 30 hp. pumping unit in this area.

During May a contract was awarded Atlas Construction Co. for construction of 18,000 ft. of 4-in. gathering lines from Hufford and Moon pools, Kansas, to a point near Hudson station in Stafford County. High waters and unfavorable ground conditions delayed starting the job until the first week in August. Using pipe from the Stafford, Kans., warehouse, contractor is reported making good progress and should have the project completed in the near future.

On the main line between Whiting, Ind., and Drumright, Okla., final work on the postwar modernization program is nearing completion. New 1,500 hp. diesel units at Blake and Drumright stations in Oklahoma were assembled and put into service early this month. Only the installation of 2,100 hp. diesel units at Freeman and Carrolton stations in Missouri remains of this project which included installation of 13 large units.

Arkansas Louisiana Gas Co. Contracts Waskom Outlet

Arkansas Louisiana Gas Co. has let contracts for a 163-mile, 20-in. line from Waskom, Tex., to the company's Perla reducing station near Malverne, Ark.

Contracts have been awarded as follows: Anderson Brothers Corp., 70

OK

EVERY STEP OF THE WAY

when OKLAHOMA CONTRACTING *is on the job!*

Ready to go! OK is ready—and qualified—to undertake your job—regardless of location or difficulty. Ample, specialized equipment in the hands of seasoned personnel—assures you that the job is OK—every step of the way—when you call in Oklahoma Contracting! Over 30,000 miles of pipe, including major sections of the world's greatest pipelines—means world-wide pipelining know-how!

30 *Years of* PROGRESS

OLDEST PIPELINE CONTRACTORS IN THE BUSINESS

OKLAHOMA CONTRACTING CO., Inc.

MERCANTILE BANK BUILDING

DALLAS, TEXAS

"Everything for the Pipeliner"

PIPE COATING and WRAPPING MACHINES
Stationary and Line Traveling

PIPE CLEANING and PRIMING MACHINES
Stationary and Line Traveling

American Steel Works
HEATING KETTLES

PIPE LINE SUPPLIES AND EQUIPMENT

PERRAULT Brothers INC.
1130 NORTH BOSTON
TULSA 6, OKLAHOMA
Phone 5-1104

MOLE
Pipeline
Cleaner

For BETTER cleaning of
CRUDE LINES
PRODUCT LINES
NATURAL GAS LINES

FOR DETAILS WRITE

Pipeline Cleaners Co.
Fort Madison, Iowa

miles from Waskom to the Columbia gas-treating plant near Magnolia, Ark.; and Latex Construction Co., northern end of the line from the Magnolia area to the Perla station.

At the Columbia gas-treating plant the new 20-in. system, with 200,000,000 cu. ft. daily capacity, will be connected with the Arkansas Louisiana existing 18-in. line.

Salt Lake Pipe Line Co.'s Pipe to Be Available Soon

Salt Lake Pipe Line Co. is scheduled to receive pipe at the end of this week for laying the 320-mile, 8-in. Salt Lake City-Boise, Idaho, section of its Salt Lake City-Pasco, Wash., 560-mile project.

Smith Construction Corp. has contracted the Salt Lake City-Burley, Idaho, section. Oklahoma Contracting Co. is building the Burley-Boise 151-mile section under supervision of A. Kilgore, spread man, with field office at Twin Falls, Idaho.

Oklahoma Contracting is undertaking the job as a joint venture with Grafe-Callahan Construction Co.

Continental to Lay Two North Texas Pool Outlets

Continental Pipe Line Co. is initiating new pipe-line construction in North Texas which will give outlets to new pools opened in the district. The outlets will also increase service for older pools.

The firm is taking up 25 miles of 4-in. line from its Little Wichita River station in northern Archer County to the Continental refinery in southern Wichita County near Wichita Falls. The line will be replaced with a 6-in. welded line.

A 3¼-in. pipe line from the Acme pool in west-central Clay County to its junction station at Deer Creek will be replaced with a 6-in. line.

Fort Smith Gas Corp. Seeks Authority to Build Line

Fort Smith Gas Corp., Fort Smith, Ark., has applied to Arkansas Public Service Commission for authority to construct 6 miles of transmission line to connect Pocahontas, Ark., with the interstate transmission line of Mississippi River Fuel Corp. The company also applied for permission to construct distribution facilities for 1,500 customers in Pocahontas.

Total cost of the project is estimated at $252,000. Company officials said the facilities could be completed within 90 days if the commission approves.

Andian National Installs Colombian Line Compressor

Andian National Co., Ltd., is installing 16 diesel centrifugal pumping units of 500 hp. each, totaling 8,000 hp. to increase the capacity of its pipe-line system extending from the De Mares concession to a marine terminal near Cartagena.

Two units will be installed at each of the eight new stations being built along the line.

Construction and installation at the new stations, as well as revamping of pumping units at existing stations, is being handled by Floyd E. Warter-

PRESERVE and PROTECT
with
FARBERTITE
The Pipe Line Coating

The Problems of
Corrosion and Electrolysis
Are Serious

Write Us Today

BRIGGS BITUMINOUS COMPOSITION CO.
1347-53 E. Montgomery Ave.
Philadelphia, Penna.

S. E. HUEY & CO.
ENGINEERS & SURVEYORS
OUACHITA BANK BLDG.
MONROE, LA.

SURVEYING & MAPPING

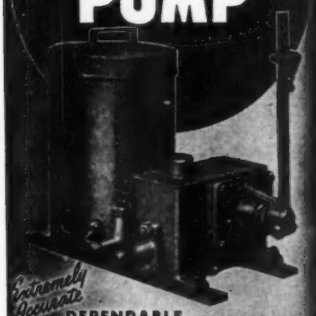
PIPE LINE SURVEYS

ONE OF THE
LARGEST STOCKS OF
INTERNATIONAL
INDUSTRIAL
MACHINERY PARTS
WEST OF THE MISSISSIPPI

Boyd will save you "down-time" by having needed parts quickly available for your International Equipment.

CLARENCE L.
BOYD
CO.
TULSA, OKLAHOMA

McCORD
TYPE "C"
CHEMICAL MEASURING
PUMP



Extremely Accurate
DEPENDABLE
Accuracy of delivery in McCord chemical pumps is the result of a finely engineered design with minimum number of parts. Dependability is insured because working parts are fully enclosed, protected from dirt and the elements. Specify McCord. For sale by National Supply Co.

Standard of the Oil Fields
McCORD
CORPORATION, DETROIT 11, MICH.

field, Jr., through the Oklahoma Engineering Co., of which he is president.

Operations in Colombia are being supervised by Benjamin F. Odum, foreman for Oklahoma Engineering.

Interprovincial May Extend Line to Gretna, Man., Area

Interprovincial Pipe Line Co., subsidiary of Imperial Oil Co., Ltd., may run its proposed Edmonton-Regina crude-oil pipe line further to Gretna, Man., which is near the border of North Dakota.

The company, now surveying the route of the 450-mile Edmonton-Regina line, is reported making application to the government board of transport commissioners for permission to build a line on to Gretna.

Reports indicate that Interprovincial's pipe line may eventually be continued down into the United States through the Duluth, Minn., area to some further destination, probably the Chicago area. It has also been reported that a branch line from Gretna to Winnipeg, Man., might possibly be built by the company.

Argentine Gas Line To Be Finished in 1949

Direccion General del Gas del Estado expects to complete its 1,100-mile, 10-in. Comodoro Rivadavia - Buenos Aires, Argentina, natural-gas line according to a schedule which will make it possible to put the system in operation in December.

According to reports, only slightly more than 100 miles of pipe remains to be laid.

East African Products Pipe Line Is Completed

The 127-mile, 6-in. Mikindani-Noli, Tanganyika, East Africa, products pipe line has been completed for the British Government, under direction of Shell Interests.

Construction was handled by Taylor Woodrow, Ltd.

Michigan Line Completed

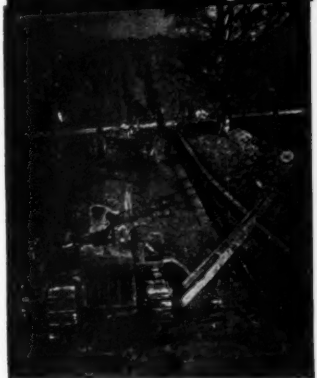
Installation of 12 miles of 8-in. natural-gas line, and a compressor station for collecting vented gas from Pentwater oil field in Michigan, has been completed, L. J. Richards, chief engineer for Dow Chemical Co., Midland, Mich., announced. Salvaged gas will be used as fuel for the company's Ludington, Mich., plant.

DON'T PAD THAT DITCH
USE KAPCO* ROCK SHIELD
FIELD TESTED FOR . . .
Toughness
- Eliminates cost of padding ditch.
- Protection on road or river crossings.
- Cut to fit any size pipe, in thickness desired.
- A mastic composition board manufactured exclusively by KEYSTONE ASPHALT PRODUCTS CO. A division of American-Marietta Co., Chicago, Ill.

Midwestern offers Kapco Rock Shield in a complete "pipeline package" — including fibre strapping, strapping tool, and aluminum seals. Immediate delivery.
*T.M. REG.

Exclusive Pipeline Distributor
MIDWESTERN
ENGINE & EQUIPMENT CO., INC
105 N. Boulder Tulsa, Okla. 3-4113

DEPENDABLY PROTECTED with Reilly PIPE ENAMEL

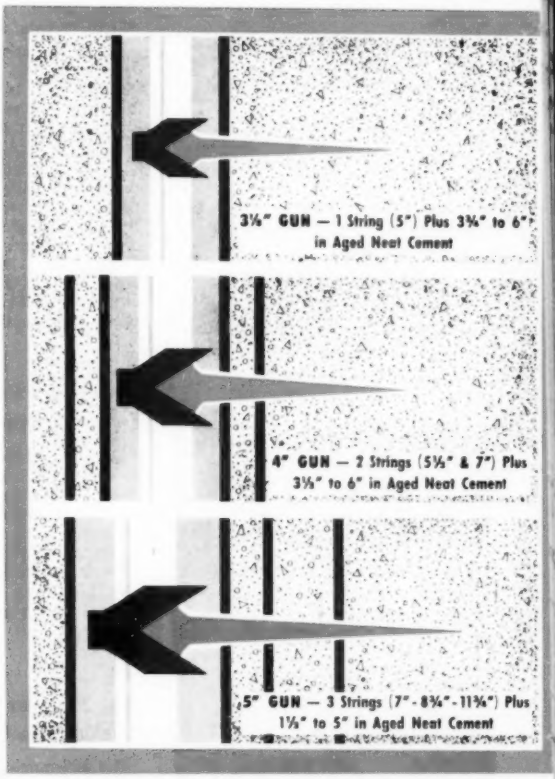


REILLY TAR & CHEMICAL CORPORATION
Merchants Bank Bldg., Indianapolis
608 Fifth Ave., New York • 2513 S. Damen Ave., Chicago
17 Plants to Serve the Nation

Paste this in your hat

HERE'S HOW

LANE-WELLS KONESHOT PENETRATES


3⅛" GUN — 1 String (5") Plus 3¾" to 6" in Aged Neat Cement
4" GUN — 2 Strings (5½" & 7") Plus 3½" to 6" in Aged Neat Cement
5" GUN — 3 Strings (7"-8¾"-11¾") Plus 1½" to 5" in Aged Neat Cement

FOR YOUR TOUGH PERFORATING JOBS

KONESHOT Perforating

LANE WELLS COMPANY

LOS ANGELES — HOUSTON — OKLAHOMA CITY
GENERAL OFFICES, EXPORT OFFICES & PLANT
5610 SO. SOTO ST., LOS ANGELES 11, CALIFORNIA

LANE WELLS SERVICE AND PRODUCTS ARE AVAILABLE THRU PETRO-TECH SERVICE CO. IN VENEZUELA

AG2

Among the

Drilling Contractors

Decrease Again Reported In Number of Active Rigs

With the number of active rotary rigs in the United States and western Canada showing a decrease for the week ended August 15 (latest report), the upturn in drilling activity which was indicated for the previous 2 weeks proved short-lived. A substantial increase in the number of operating rigs in western Canada and smaller gains in the Arkansas-North Louisiana and East Texas and Kansas districts during the week were more than offset by a falling off in activity in all other areas. The decline, however, did not bring the total down to the low level reached the week ended July 25 when only 1,997 rigs were reported operating. The number of active rigs by areas follows:

ROTARY RIGS IN OPERATION*
(United States and Western Canada)

	Week ended	Change week ended	
	8-15-49	8-8-49	8-16-48
Gulf Coast	519	0	—72
W. Tex. N. M.	511	—15	—102
Ark.-N. La.-E. Tex.	168	+7	—7
Oklahoma	230	—8	—57
Kansas	113	+4	—19
Illinois-Eastern	129	—3	—25
Rocky Mountains	109	—8	—62
Pacific Coast	151	—1	—39
Total U. S.	1,930	—24	—383
Western Canada	86	+11	+34
Total	2,016	—13	—349

*Courtesy Hughes Tool Co.

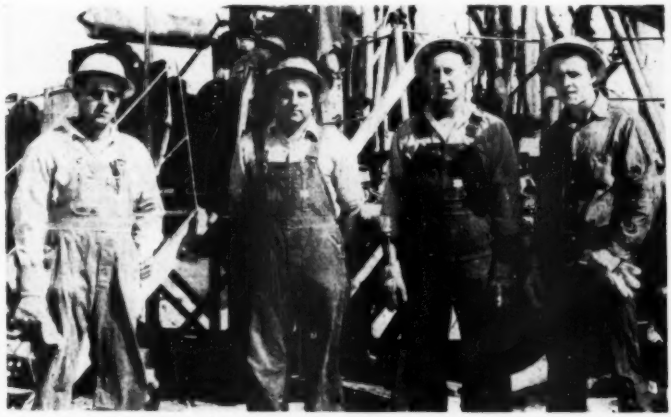
Loffland Employs Pyeatt As Contact Representative

Loffland Brothers Co., Tulsa, announces that L. A. Pyeatt, who for the past 15 years has been engaged in the oil field supply and equipment business in the Mid-Continent and California, has become associated with the company as contact representative in the Dallas, Fort Worth and West Texas areas. Just prior to his connection with Loffland, he was vice president of Aeroquipt Sales & Engineering, Inc., Fort Worth. He will continue to make headquarters in the latter city.

Johnson & Flesher Drilling Co., Oklahoma City, has been awarded contract to drill a Wilcox sand test for Ray P. Diehl northwest of Tryon, Lincoln County, Oklahoma. Tentative location is in 10-16n-3e. Contract is for 4,750 ft.

B and R Drilling Co., Russell, Kans., is the contractor on a rank wildcat test being drilled for Inland Oil, Inc., in 18-18-10e, western Lyon County, northeastern Kansas. The test is 11 miles northwest of Emporia and 28 miles southwest of the Davis Ranch pool recently opened by Carter Oil Co. in Wabaunsee County.

Golden Meadow Well Service Co., Baton Rouge, La., has been awarded contract by Shell Oil Co., Inc., for an 8,500-ft. well on the latter's Main



Daylight crew of Gene Reid Drilling Co., Inc., Bakersfield, operating for Independent Exploration Co. in the Placerita field, Los Angeles County, California. Left to right: Herbert Thoene, driller; W. D. Thoene, derrick; Herb Fisher, lead tong; and R. H. Riggins, cathead

USE 'BESTOLIFE IT'S BETTER

'BESTOLIFE—the Lead Seal Joint Compound used successfully in the Drilling and Refining Industries for years—is immediately available through more than 100 distributors in the U.S.A.

Your nearest supply house field store probably has 'BESTOLIFE in stock for immediate delivery. Use 'BESTOLIFE—it's BETTER!

EXPORT: THE NATIONAL SUPPLY CORP., 30 ROCKEFELLER PLAZA, NEW YORK

I. H. GRANCELL
1601 EAST NADEAU STREET
LOS ANGELES 1, CALIFORNIA

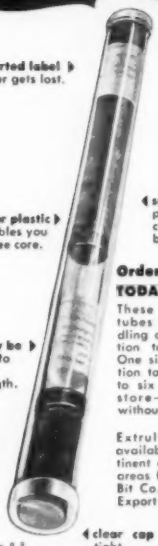
Simplex HYDRAULIC JACKS

Dependable performance, day after day on difficult jobs, produces reports like these from Simplex Hydraulic users. Engineered for faster, safer jacking, these jacks include such features as leakproof high pressure seals of Neoprene; non-sticking ball valves; smooth acting ram of SAE X1112 steel — plus many others. Eight models; capacities from 3 to 100 tons — all safety-tested to 50% over rated capacity.

SEND FOR BULLETIN: HYDRAULIC 49

1899 1949
Simplex
LEVER · SCREW · HYDRAULIC
Jacks
TEMPLETON, KENLY & COMPANY
1054 So. Central Ave., Chicago 44, Illinois

Simplify Core Handling and Storage with
Extrulite Core Tubes



Red Cap prevents reversing sample—may be sealed.
Inserted label never gets lost.
light, unbreakable plastic. Perfect for air freight.
smaller tube may be placed inside to account for core section being tested.
clear plastic enables you to see core.
Order your Core Tubes TODAY!
These new, clear plastic tubes simplify core handling and storage in addition to preserving cores. One simple sealing operation takes the place of up to six core cans. Easy to store—may be shipped without further wrapping.
may be cut to any length.
Extrulite Core Tubes are available in the Mid-Continent and Rocky Mountain areas from the Reed Roller Bit Co. For California and Export Sales, write factory.
clear cap factory sealed, air tight.

Extruders INC
8509 Higuera St. Culver City, California

NEEDS NO SEALING COMPOUND

UNBRAKO
DRYSEAL
THREAD
PRESSURE PLUG

. . . seals pressure-tight without the use of sealing compounds. Features the "Dryseal" Pipe Thread originally developed for use with SO_2, ammonia, and other refrigerants. Offers a valuable solution to leakage problems in high pressure equipment of all kinds.

Unique design of the "Dryseal" Thread provides actual crushing and sealing at both major and minor diameters, effectively preventing spiral leakage, even under extreme pressures.

Incorporates all the important features of the regular UNBRAKO Pressure Plug, including fully formed threads, uniform taper and perfect roundness.

A full range of sizes from 1/16" to 2", National Pipe Thread Fuel, is available. Full details are given in Bulletin 675.

OVER 46 YEARS IN BUSINESS

STANDARD PRESSED STEEL CO.
JENKINTOWN, PENNSYLVANIA, BOX 790
Chicago • Detroit • St. Louis • San Francisco

Pass prospect, located in the Gulf of Mexico, offshore from Plaquemines Parish, Louisiana.

Northern Development Co., Edmonton, has started a Devonian exploratory test for Woodbend Devon Oils, Ltd., 3 miles southeast of Carbondale, in LST 7, 10-55n-24w4th, Alberta, Canada.

Puckett Drilling Co., Wewoka, Okla., is starting a wildcat test for W. O. Allen on the latter's Caldwell lease in 25-18n-2e, east of the new Southeast Ramsey pool, Payne County, Oklahoma.

Regent Drilling Co., Ltd., Edmonton, is moving in to drill a wildcat test for Royalite Oil Co., Ltd., and T. L. Brook on the Stoney Indian Reserve, north of Woodbend, Alberta Province, Canada.

Coastal Drilling Co., Los Angeles, has the contract for Humble Oil & Refining Co.'s second test to be drilled in the Somis area, Ventura County, California. It is 2 Berylwood Investment, on the Rancho Las Posas in 33-3n-20w, 1,000 ft. north of the initial test, recently abandoned at 9,292 ft.

Judy Drilling Co. is drilling for M. B. Armer at a semiwildcat location ½ mile southeast of the Fuhrman pool, Hughes County, Oklahoma. The location is on the Powell lease in 36-9n-9e.

Big Chief Drilling Co., Oklahoma City, is contractor for H. Barksde Brown & Co. on the latter's 1 Armstrong, 35-8n-1w, 2 miles east of Cannonsburg, Adams County, Mississippi.

Ray M. Rogers, Quinton, Okla., contractor on Intex Oil Co.'s recently completed gas discovery well (1 Welsh) located 4 miles east of McAlester, Pittsburg County, Oklahoma, is starting a second well for the same operator in that area. The new test, 1 Dupuich, SE NE SE 35-6n-15e, is ¾ mile east of the discovery well, which flowed 1,000,000 cu. ft. of gas daily from a sand at 1,150-85 ft. Cable tools are being used.

Can-Tex Drilling Co., Calgary, has contracted to drill a wildcat test for Amerada Petroleum Corp. and Stanolind Oil & Gas Co. in the Sunnynook area, in LSD 14, 23-26-14w4th, Alberta, Canada.

J. W. Griffith Drilling Co. is the contractor for Roger Lacy, Inc., on a 6,700-ft. wildcat test being started in the John Saunders Survey, 3 miles southeast of Patroon, Shelby County, East Texas.

Arrow Drilling Co., Tulsa, has contracted to drill a lower Rodessa exploratory test for Sells Petroleum Co. in the Samuel Leeper Survey, 2 miles north of Sand Flat, Smith County, Texas. Location is on the Hackett lease.

Joe Bradley, Davis, Okla., has taken two additional contracts, one a 2,500-ft. test for C. L. Carlock in 36-1n-2e, 4 miles west of Sulphur, Murray County, Oklahoma, and the other a 3,000-ft. test for Deep Well Oil Corp. in 22-4s-19e, Pushmataha County.

Lee Drilling Co., Odessa, Tex., has taken the contract to drill another well for Stanolind Oil & Gas Co. in the Midland Farms field, Andrews County, West Texas. It will be 4-F Faskin, Section 10, Block 42, Township 1n of GMMB&A Survey.

Justiss & Mears, Good Pine, La., is starting a 5,700-ft. wildcat test for Carter Oil Co. in 4-9n-6e, 3 miles west of Harrisonburg, Catahoula Parish, Louisiana. They also have the contract for drilling Dan L. Reynolds 1 Crickett, 32-11n-3e, 3 miles east of the Olla townsite in LaSalle Parish. The latter contract is for 3,000 ft.

A letter or postal will bring a free copy of our booklet "Dragon Products"

•

GET THEM AT YOUR SUPPLY STORE

DRAGON MFG. CO.
Marietta, Ohio

Standco
NO-SMOKE
STANDCO BRAKE LINING

Is the driller's best friend because it makes the easiest brake known and "feeds off evenly while drilling." It never scores brake rims. See pages 3608-3613, Composite Catalog.

Standco Brake Lining Co.
HOUSTON

WEB WILSON
Tiger Tooth TONG DIES
A POSITIVE "BITING" GRIP ON THE HARDEST TOOL JOINTS
Web Wilson "Tiger Tooth" Tong Dies are especially recommended for flame hardened and hard metal surfaced tool joints or wear subs. Specify WEB WILSON "TIGER TOOTH" TONG DIES.
WEB WILSON
W. W. WILSON BLDG.
HUNTINGTON PARK
CALIFORNIA

STRETCH **LIFE and**
SHRINK **WEAR in Engines—**
USE

MARVEL MYSTERY OIL

Oil field engines run long—and hot! Wear is greater, life is shorter—unless you give special care. Top cylinder lubrication is your easiest way to add years of extra service to the life of any engine.

Marvel Mystery Oil and the Marvel Inverse Oiler are positive protection for oft-neglected parts—in the vital upper-motor area! Extra-tough Marvel armors valves and guides with super-strong film that resists sizzling heat. Besides, Marvel cleans as it coats—strips off sticky gums and varnish—keeps internal surfaces cleared and clad for action.

Proper lubrication adds life and power, saves time and trouble. Ask for the facts. Emerol Mfg. Co., Inc., 242 West 69th Street, New York 23, New York.

The Marvel Inverse Oiler, easily installed, proportions the flow of Marvel Mystery Oil precisely to the needs of your engine.

use the
MARVEL
INVERSE OILER WITH MARVEL MYSTERY OIL

Need Stainless Steel?
CALL US!

SYMBOL OF SERVICE FOR STEEL USERS

It's always wise to "Call Us" when you need stainless steel. For it's a fact that *U·S·S* Stainless Steel is "tops" in quality, dependability and proven excellence.

Right now our stocks include No. 2B Finish Sheets and No. 4 Finish Sheets of uniform quality. Also bars, meeting high standards of machinability; plates up to 120" wide and 360" long . . . as well as welded and seamless tubing, pipe, angles, channels, welding electrodes in all standard grades and specifications are on hand for your needs.

So call our nearest warehouse or sales office. You'll get prompt, courteous service. Meanwhile, why not fill in and return the convenient coupon for our free booklets on U·S·S Stainless Steel? Do it now.

United States Steel Supply Company
Dept. FF-89, 208 S. La Salle St., Chicago 4, Ill.

Without obligation on our part, please send us FREE booklets on U·S·S Stainless Steel as checked below:

☐ Introduction to Stainless Steel ☐ Fabrication of Stainless Steel

Name.....Title.....
Firm Name.....
Address.....
City.....Zone.....State.....

UNITED STATES STEEL SUPPLY COMPANY

Warehouses: BALTIMORE · BOSTON · CHICAGO · CLEVELAND · LOS ANGELES · MILWAUKEE · MOLINE, ILL. · NEWARK · PITTSBURGH · PORTLAND, ORE. · SAN FRANCISCO · SEATTLE · ST. LOUIS · TWIN CITY (ST. PAUL)
Also Sales Offices at: KANSAS CITY, MO. · PHILADELPHIA · TOLEDO · TULSA · YOUNGSTOWN
Headquarters Offices: 208 S. La Salle St.—Chicago 4, Ill.

USS
UNITED STATES STEEL

National
GEOPHYSICAL
COMPANY, INC.
HOUSTON DALLAS MIDLAND
LEADING the Field of Seismic Exploration
From The Gulf To The Arctic

Exploration and Drilling

Canada's Deepest Producer Is Largest Gasser

CANADA'S deepest producing well is also the largest gas well ever completed in the dominion, with a conservatively estimated potential of 83,000,000 cu. ft. per day, plus an estimated potential 3,000 bbl. daily of 52.5°-gravity condensate.

At a producing depth of 12,473 ft., Canadian Gulf Oil Co. 1 Walter Marr, LSD 1, 29-4-29w4, on the famous Pincher Creek structure in the Alberta foothills hung up that record. In addition the well demonstrates one of two alternatives. It either opens up a new gas-condensate field on a local high on the larger Pincher Creek anticline, or it is a 7-mile northwest extension of the field opened by the original Gulf discovery, 1 Pincher Creek, LSD 15, 24-3-29w4.

This is strictly a "blue chip" type of play. The Pincher Creek structure lies in the overthrust area in the foothills belt that lies just east of the Rocky Mountains. This foothills belt also marks the western boundary of the Alberta trough, where the Devonian reef play is now so active. Pincher Creek is about 16 miles north of the United States-Canada border, not far from Glacier National Park in Montana. About 80 miles farther northwest is the famous Turner Valley field, for many years Canada's only major field. About 20 miles farther northwest beyond the north end of Turner Valley, lies Jumping Pound, where Shell Oil Co. of Canada found a gas-condensate field.

In the latter part of March and early part of April 1948, Gulf's discovery well at Pincher Creek had a series of initial tests that indicated a gas-condensate discovery, in the Madison lime at around 12,000 ft. It has since been tested in deeper portions of the Madison, in the hope that perhaps oil might be found in a lower porous zone. So far, however, only gas-condensate has resulted.

The present well, 1 Marr, was started soon after the discovery well had shown for production. Gulf has a block of something over 100 sections along a northwest-southeast trend, reportedly taken on the basis of seismic work, plus surface, plus regional trend. When the second well was started, so far from the first, it was reported that Gulf's interpretation showed two local highs on an anticlinal fold. This would be consistent with the regional geology.

Now Gulf has two gas-condensate producers, 7 miles apart. In both wells Gulf probably has a fair idea of where the water level (if any present) is in the Madison. Normally one would figure that their geological data on the saddle between the two highs would indicate whether the two might connect. But any geologist who has ever seen some of the cross-sections Alberta geologists have of overthrust areas will only throw up his hands. Some of them look more like a cubist artist's nightmare than a geological cross-section.

Even so, however, the situation is promising for a company with plenty of capital and time. Gas pipe lines out of Alberta are inevitable within a few years at the most. The gas at Pincher Creek, whether it be one enormous field, or two separate fields, will be an extremely welcome reserve for any gas pipe line. With a market for the gas, the light liquid hydrocarbons from the condensate will be worth plenty of money.

Then there is always the hope that this time another Turner Valley has been found. Turner Valley for years produced only gas condensate from the top, but down-flank drilling found oil—and lots of it. In fact it finally produced through a closure of 5,500 ft. on the east side and 4,500 ft. on the west side.

It will be interesting to see where the next Pincher Creek locations are made. Will they be along the axis of the structure, but somewhere in between the two producers? That might mean Gulf believes there is a good chance for one enormous gas-condensate field. Or will they be made down flank from one of the present producers? That might mean a search for true oil down dip, as at Turner Valley.

—Charles J. Deegan

HIGHLIGHTS OF WEEK'S DEVELOPMENTS

TEXAS PANHANDLE.—Sinclair Oil Co.'s second well in Lips field of Roberts County recovered 180 ft. of oil and gas-cut mud on a drill-stem test from 8,900-45 ft. Flowing pressure was zero, with bottom-hole pressure of 1,280 psi. An earlier test at 8,831-8,900 ft. recovered 30 ft. of gas and oil-cut mud, under flowing pressure of 800 psi.

WEST TEXAS.—Completion tests had not been reported on W. A. Moncrief, et al., 1 Huckabee, 1½-mile southeast extension to the south extension area of North Snyder field of Scurry County. Conservative estimates of the well placed it in the 35-50-bbl.-per-hour class, while field reports credit it with being able to flow at the rate of 100 bbl. an hour. One feature of the field has been more or less determined, that water level throughout is pretty steady at —4,500 ft.

ROCKY MOUNTAIN AREA.—R. E. Havenstrite's Oak Creek, Colorado, discovery is reported testing at more than 300 bbl. of 38°-gravity oil daily. Atlantic Refining Co.'s Lightning Creek, Wyoming, basal Sundance wildcat is now being tested with the well expected to be a good producer. Ohio Oil Co. is testing its second Gurley area well, Cheyenne County, Nebraska, with the discovery now completed pumping 225 bbl. of oil daily.

TEXAS GULF COAST.—Some of the nation's shallowest flowing production was discovered when Freeport Sulphur Co. completed the A-2 Fee, flowing about 55 bbl. of 34°-gravity oil per day through 9/64-in. choke from 1,360-83 ft. in gravel-packed open hole, with 225 psi. pressure on the tubing. The wildcat is located 5 miles southeast of Freeport, and 60 miles south of Houston, in Brazoria County.

KANSAS

Lansing Production Found In Phillips County Wildcat

ANOTHER new pool for Phillips County in the northwestern part of the state appears to have been found by B and R Drilling Co. in its 1 Huffstutter, NE NE NE 6-2-18, which recovered 40 ft. of clean oil in a drill-stem test of Lansing lime at 3,407-35 ft. Lansing was topped at 3,375 ft. (—1,139 ft.), and drilled to a total depth of 3,449 ft. Following the test, casing was run to 3,444 ft., and will be perforated in the pay zone. The discovery is 2 miles northeast of the North Dayton pool.

The same operator has another possible new pool opener in its 1 Dauber, SE SE NW 12-13-13, 9 miles northeast of the Russell pool in Russell County, which also encountered favorable showings in the Lansing, topped at 2,720 ft. (—1,135 ft.), and has casing cemented at 2,997 ft. for testing. Hole was drilled to 3,275 ft. in the Arbuckle but found that zone unproductive.

Bay Petroleum Corp. 1 McCauley, NW NW SE 34-17-13, a half mile south and east of production in the Krug pool, Barton County, is preparing to test oil showings encountered in the Arbuckle, topped at 3,375 ft. (—1,487 ft.). Rotary hole was drilled to 3,377 ft. and with 5-in. casing cemented at 3,376 ft., standard tools are being set up to drill in. Should the Arbuckle prove unproductive, hole probably will be plugged back to the Lansing, where, in a drill-stem test at 3,273-80 ft., 40 ft. of oil and gas-cut mud was recovered, indicating possible production in that zone. Although close to the Krug pool, it is separated from production by several dry holes, and probably will establish a new area.

Although completion has been delayed, Barbara Oil Co. 1 Page, SW SW SW 15-33-11, Mississippi lime pool-opener in Barber County, in the southern part of the state, continues to look like a good well. It filled 3,700 ft. with oil with casing perforated at 4,546-65 ft. in the lime, topped at 4,475 ft. (—3,040 ft.). When swab was run only once, it started flowing intermittently, but no production test has been made at latest report. The location, 11 miles north of the Oklahoma line, is 7 miles east of the Boggs pool, nearest production.

KANSAS SUCCESSFUL WILDCATS

Barton County: Elreco et al 1 Stumps "B," NW NW SE 24-18s-11w, 3,000 bbl. of 38.9°-gravity oil per day from Arbuckle at 3,285-99 ft.; TD 3,299 ft., anhydrite 540 ft., Heebner 2,861 ft., lime 2,987 ft., Lansing 2,996 ft.

Ellis County: M. B. Armer 1 Dreiling, SE SE NE 21-14s-16w, 173 bbl. of 31.7°-gravity oil per day from Arbuckle at 3,367-83 ft.; TD 3,383 ft., anhydrite 960 ft., Heebner 3,055 ft., Toronto 3,075 ft., Lansing 3,102 ft.

KANSAS WILDCAT FAILURES

Butler County: H & M Drilling Co. 1 Bachelder, NE NE NE 17-25s-3e, dry, TD 2,852 ft., Lansing 2,050 ft., Mississippian 2,768 ft.

Graham County: Heathman Drilling Co. 1 Sayers, NE NE NE 11-8s-21w, dry, TD 3,528 ft., anhydrite 1,547 ft., Heebner 3,177 ft., Lansing 3,217 ft., basal Kansas City 3,418 ft, conglomerate 3,446 ft., Arbuckle 3,499 ft.

Greenwood County: Mora Drilling Co. 1 N. Y. Life Insurance Co., SW SW NE 4-26s-11e, dry, TD 2,047 ft., Mississippian 1,990 ft.

Marion County: E. H. Adair 1 Slocombe, SW SE SE 33-21s-5e, dry, TD 2,575 ft., Lansing 1,725 ft., Viola 2,510 ft.

McPherson County: Westgate-Greenland and A. R. Jones 1 Nugler, NW SE SW 10-20s-3w, dry, TD 3,320 ft., Lansing 2,485 ft., Mississippian 3,145 ft.

Rice County: Murfin Drilling Co. et al 1 Sims, NW NW NW 9-19s-6w, dry, TD 3,585 ft., Ft. Riley 1,264 ft., Topeka 2,320 ft., Lansing 2,737 ft., basal Kansas City 3,127 ft., conglomerate 3,192 ft., Kinderhook 3,255 ft., Misener 3,388 ft., Viola 3,447 ft., Simpson 3,458 ft., Arbuckle 3,550 ft.

Rooks County: Anderson-Prichard Oil Corp. 1 Veverka "B," SW SE SE 20-8s-19w, dry, TD 3,512 ft., anhydrite 1,435 ft., Topeka 2,967 ft., Heebner 3,167 ft., Lansing 3,189 ft., conglomerate 3,466 ft., Arbuckle 3,482 ft.

MISSISSIPPI

Carter Announces Location For Smackover Lime Test

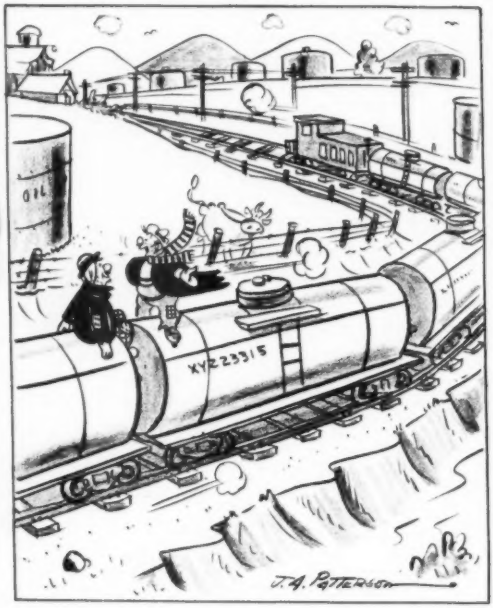
JACKSON.—Carter Oil Co. has announced location for the long awaited Smackover lime test in the Pickens field, Madison and Yazoo counties, Mississippi. Test will be the 1 J. L. Wilson, 30-12n-3e, Yazoo County.

Big Chief Drilling Co.-W. B. Osborn 1 George Ziegler, wildcat, Lincoln County, Miss., continues to be shut down waiting orders, and has not been officially plugged and abandoned yet.

At Rodney Prospect, Jefferson County, Mississippi, Danciger Oil & Refining Co. 1 Kate S. Logan, 18-10n-1w, commenced coring in Lower Tuscaloosa at 9,371 ft., with no shows at this interval. However, on drill-stem test at total depth of 9,414 ft., the well flowed an unestimated amount of gas, condensate and gas-cut mud, and developed 1,370 psi. pressure, in 9 minutes. Operators are now coring below 9,432 ft.

Stanolind Oil & Gas Co. 1 J. B. Dockery, Russum field, Franklin-Jefferson counties, Mississippi, is still closed down while additional storage is erected.

Another wildcat being closely watched is



THE OIL AND GAS JOURNAL

"It's been nice seein' you again, Horace—drop back to car XYZ53217 anytime!"

WITH A D&S CORE BARREL

Cores for less!
Cuts full hole for less!

Drilling & Service, Inc.

3031 Elm Street — Dallas 1, Texas
Riverside 6811 — Tremont 7-5559

Other Offices · Stocks · Services
Shreveport, La. — 7-8627 — Odessa, Texas — 6774
Casper, Wyo. — 3739 — *Norman, Okla. — 4360
Hobbs, N. M. — 1015R — Lindsay, Okla. — 255
*Car mobile phones through Oklahoma City, Ardmore and Lawton: ZF44645 and ZF74455

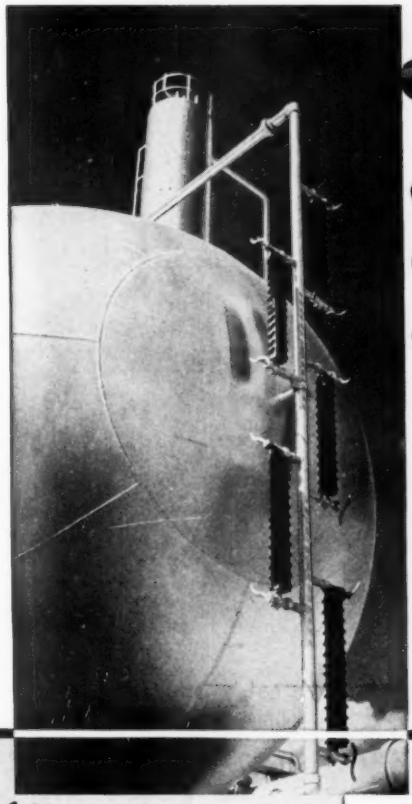
Foreign | D. T. O'Connor, 500 Fifth Avenue, New York, N.Y.
United Oil Well Service, Caracas, Venezuela
Denton-Spencer Co., Ltd., Calgary, Alberta, Canada

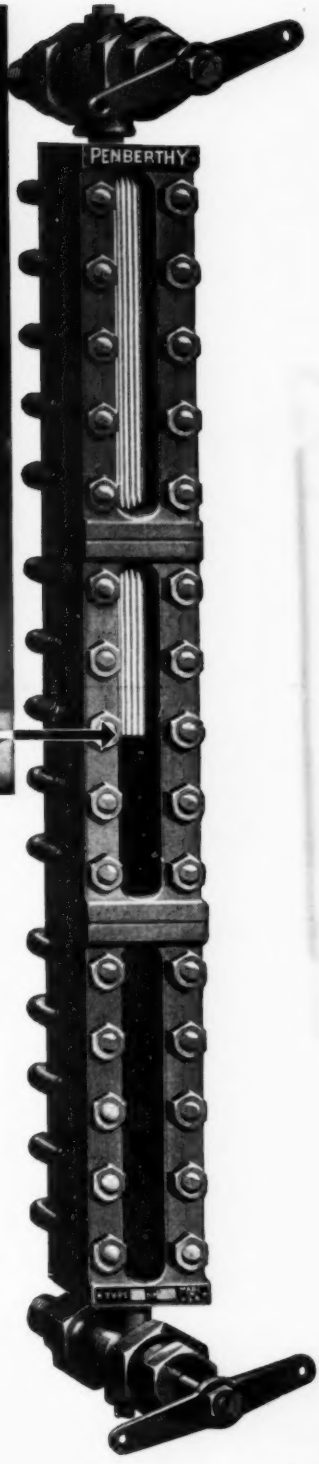
WHEN YOU MUST

BE SURE

OF THE

LIQUID LEVEL





Use

PENBERTHY "REFLEX" GAGES

DROP FORGED STEEL

There can be no error in reading the liquid level when you depend upon Penberthy "Reflex" Gages. The contrast between the black portion of the glass showing liquid and the white portion showing empty space is sharp and unmistakable.

Penberthy Drop Forged Steel Reflex Gages are available in whatever lengths required and for various liquids; they meet API—ASME requirements and are recommended for pressures up to 3000 psi at 100° F and 1000 psi at 1000° F.

PENBERTHY INJECTOR COMPANY

Manufacturers of Quality Products Since 1886

DETROIT 2, MICH. • ***Canadian Plant—Windsor, Ont.***

2246

LEE C. Moore

HOW'S THIS FOR SPEED?

The Lee C. Moore patented Jackknife Cantilever Rotary Drilling Mast is designed for speed in transporting and erecting. Once on location all assembling and stringing up is done on the ground. Thus costly hours are saved from the time the mast arrives until it is ready to start making hole.

LEE C. MOORE CORPORATION

TULSA • DALLAS • HOUSTON • MIDLAND • SHREVEPORT • WICHITA • CENTRALIA • PITTSBURGH

Export Office — 9 Rockefeller Plaza, New York 20, N. Y.

the L. M. Lockhart 1 U.S.A., 27-6n-4e, Franklin County, Mississippi. Unconfirmed oil shows were encountered in the Wilcox sand.

The five new locations in Mississippi include three wildcat starts, one each in Franklin, Itawamba and Wayne counties. There were three dry exploratory tests completed, one each in Jasper, Jefferson and Wayne counties.

MISSISSIPPI WILDCAT FAILURES

Jasper County: C. Porter Johnson et al 1 W. O. McCormick, 34-4n-12e, dry, TD 6,286 ft.

Jefferson County: H. Barksdale Brown & Co. 1 G. W. Armstrong, 35-8n-1w, dry, TD 6,205 ft.

Wayne County: Humble Oil & Refining Co. 1 Masonite Corp.-G. M. & O. Land Co., 29-7n-7w, dry, TD 8,463 ft.

N. CENTRAL TEXAS

New Ellenburger Field in Jack County Is Assured

WICHITA FALLS.—Confirmation of a new Ellenburger field in Jack County was assured at Mid-Continent Petroleum Corp. 1 Thweatt, G. W. Goldiron Survey, A-1826, north offset to the discovery. The well flowed 220 bbl. of oil in 13 hours, through 16/64-in. choke, from bottom of casing at 6,276 ft. and total depth at 6,430 ft.

Other Jack County activity, which has been one of North Central Texas' hottest areas, included: Mid-Continent 1 Davis, J. J. Shelton Survey, just west of the Wise County line, which was drilling below 5,873 ft. Mid-Continent 1 G. W. Fowler, C. H. Simpson Survey, 8 miles northeast of Jacksboro, recovered 20½ ft. of Ellenburger dolomite, having shows of oil, from 6,456-77 ft. It was to drill-stem test from 6,426-77 ft.

Four miles west of Jacksboro, S. D. Johnson 1 W. R. Johnson, C. Vandever Survey, was drilling below 5,245 ft.

In northwestern Jack County, Woods Drilling Co. et al 1-O G. P. Stewart, continued drilling below 4,429 ft. after topping the Caddo at 4,412 ft.

Russell Maguire 1 M. U. Johnson, S. A. & M. G. Survey, A-585, 10 miles southeast of Jacksboro, was shut in at 4,458 ft. after reporting an estimated 2,800,000 cu. ft. of gas a day. Shut-in casing pressure was 650 psi. The well entered the conglomerate around 4,400 ft., which had shows of oil and gas. Location is 2 miles southeast of new conglomerate production.

Archer County.—Akin & Dimock 2 Campbell, Block 1811, TE&L Survey, approximately 2 miles southwest of the same firm's recent Mississippian discovery, flowed at the rate of 3-4 bbl. of oil an hour after drilling plug on casing set on top of the Bend conglomerate, at 5,074 ft. Total depth was 5,094 ft. The flow was gaged through 14/64-in. tubing choke, under 127 psi. pressure. Shut-in pressure on casing was 533 psi.

Throckmorton County.—Deep Rock Oil Corp. 1 T. W. Foreman, Block 3040, TE&L Survey, 9 miles northeast of Throckmorton, completed for a flowing potential of 52½ bbl. of 37.5°-gravity oil, plus some water, from the Caddo at 4,549-50 ft. Open hole section was treated with 4,000 gal.

NORTH CENTRAL TEXAS (DISTRICTS 9 & 7-B) SUCCESSFUL WILDCATS

Callahan County: Woodley Petroleum Co. 1 K. V. Dugan, Sec. 72, BBB&C Sur., 3 mi. N Clyde, pumped 12 bbl. 37°-gravity oil a day, oil sand 1,639 ft., TD 1,669 ft., PB 1,649 ft.

Clay County: Jack Grace Production Co. 1 W. C. Fields, Blk. 19, Grayson CSL, A-156, 8½ mi. SW Henrietta, flowed 168 bbl. 41°-gravity oil a day, 12/64-in. choke, Caddo 5,921-46 ft., TD, GOR 490 cu. ft., CP 550 psi., TP 175 psi.

Jack County: Walter L. Plemons Producing Co. 1 S. C. Cooper, Sec. 3314, TE&L Sur., 4 mi. N Jermyn, flowed 168 bbl. 42°-gravity oil in 12 hr., 21/64-in. choke, Caddo 4,538-66 ft., TD, GOR 500 cu. ft., CP 850 psi., TP 200 psi.

Nolan County: Skelly Oil Co. 1 E. A. Ater, 67-23-T&P, 5 mi. SW Rosco, pumped 154 bbl. 44°-gravity oil a day, Ellenburger top 7,086 ft., pay 7,097-7,118 ft., TD 7,155 ft., PB 7,120 ft., elev. 2,444 ft.

NORTH CENTRAL TEXAS (DISTRICTS 9 & 7-B) WILDCAT FAILURES

Archer County: Fain & McGaha 1 Mrs. L. Kinder, Lot 63, Blk. 5, Clark & Plumb Subd., 5½ mi. NE Archer City, dry, TD 4,040 ft.

Callahan County: M. E. Daniel 1 J. D. Warren, Sec. 14, D&DA Lands, 5 mi. NW Putman, dry, TD 4,153 ft., Caddo 3,258 ft., Ellenburger 3,943 ft., elev. 1,475 ft.

Cooke County: G. R. Mitchell 2 R. W. Trew, Sec. 15, BBB&C Sur., A-147, 3 mi. NW Hood, dry, TD 1,615 ft.

Fisher County: Roeser & Pendleton, Inc., 1 L. Jameson, 109-1-H&TC, 7 mi. NE Rotan, dry, TD 6,195 ft., Mississippian 6,020 ft., Chappell 6,055 ft., elev. 1,439 ft.

Haskell County: Wright, Clark & Senkel, Inc., et al 1 V. C. Alvis, 9-4-H&TC, 4 mi. NW Rochester, dry, TD 5,056 ft., Dotham 2,305 ft., Saddle Creek 2,630 ft., Hope 2,825 ft., Strawn sand 5,010 ft., no shows, elev. 1,592 ft.

Jack County: Bridwell Oil Co. 1 "A" J. R Haisell, Sec. M. B. Lloyd Sur., A-1924, 9 mi. SE Bryson, dry, TD 5,142 ft., sand with light oil show 3,605-12 ft.

Creslenn Oil Co. 1 A. E. Sewell, J. E Hopkins Sur., A-291, 3½ mi. S Jacksboro, dry, TD 3,220 ft.

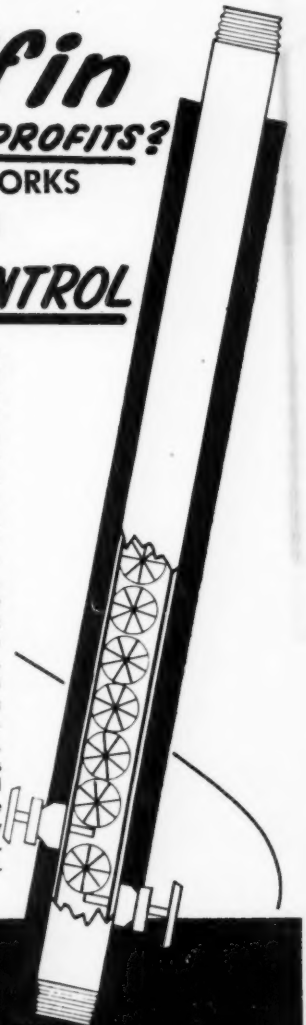
Henry Grace Production Co. 1 Shallow D. Lindsey, I. N. Wright Sur., A-898, 9½ mi. NW Jacksboro, dry, TD 502 ft.

Jack Grace Production Co. 1 Garrett & McMahon, R. Green Sur., A-1684, 9½ mi. N Jacksboro, dry, TD 5,631 ft., Caddo 5,127 ft., conglomerate 5,464 ft.

Jones County: Roark, Hooker, Roark and

Paraffin
EATING UP YOUR PROFITS?
SUNSHINE IRON WORKS
SPECIALIZE IN
PARAFFIN CONTROL

Stop that paraffin before it stops your pumping; use field-engineered Sunshine Iron Works Automatic Paraffin Control Tools. For regular surface line cleanout, depend on the S-I-W Ball Rabbit and Ball Dispenser. The Dispenser holds a 3 months' supply of Balls, and is installed in the line near the well. Your pumper merely works a couple of plungers once a week to release Ball Rabbits into the tubing. It's easy to collect the Balls from the trap, and re-load Dispenser. Wax and oil are saved by being regularly mixed and driven into the tanks. S-I-W's Ball Rabbit is made of 14 gauge sheet metal, with keen scraping edges that keep a full opening at all times. Sunshine Iron Works Paraffin Control Tools collect the paraffin that may keep you from collecting maximum allowable.



Sunshine Iron Works
601 W. MURPHY - PHONE 4374 - ODESSA, TEXAS

NEW

HERCULES LUBRICATING UPPER GLAND

Protects polished rod and liner against excessive wear

Designed with a minimum of parts for easy installation and economical operation. This new lubricating gland lengthens the life of the rod or liner as well as the packing in the stuffing box. On various tests, the life of the polished rod or liner and the packing in the stuffing box was increased many fold. Equipped with zerk fitting to insert bearing grease and with a regular Hercules cone packing ring, serving as a wiper ring. Fits all type Hercules stuffing boxes now in use.

Write for Bulletin No. 124-SBLG

SOLD AT ALL SUPPLY STORES

California Representative:
L. T. (Ted) WALTIMIRE
Ph. 4-4169 P. O. Box 1612
BAKERSFIELD, CALIF.

HERCULES TOOL TULSA

HERCULES TOOL COMPANY

Manufacturers of Oil Field Equipment

General Office and Plant:
17th and Phoenix
P. O. Box 284, Tulsa 1, Oklahoma
Cable Address "HERTOCO"
Telephone 3-1186

R. H. R. Drilling Co. 1-A Brown-Sears, Blk. 15, League 150, DeWitt CSL, 2 mi. S Noodle, dry, TD 4,890 ft.

Carl Shoults 1 Jess Young, Sec. 2, GH&H Sur., 6 mi. E Hamlin, dry, TD 5,011 ft., Noodle Creek 2,310 ft., Flippen 2,947 ft., Swastika 3,040 ft., Strawn 3,942 ft., elev. 1,646 ft.

Ungren & Frazier 1 M. B. Herring, Blk. 10, G. Martinez Sur., 194, 1 mi. N Hawley, dry, TD 2,111 ft.

Taylor County: Geochemical Surveys 1 O. Mason, Blk. 25, League 148, Grimes CSL, 1½ mi. NE Merkel, dry, TD 2,748 ft.

Joe Josephson 1 P. L. Bland, 8-18-T&P, 3 mi. SW Merkel, dry, TD 3,647 ft., Saddle Creek 2,739 ft., Gunsight 3,070 3,070 ft., Reef 3,633 ft., elev. 1,924 ft.

Royal Oil & Gas Co. 1 Charlie Yost, 23-8-SPRR, 7 mi. SE Abilene, dry, TD 4,850 ft., Canyon 3,030 ft., Ellenburger 4,720 ft., elev. 1,910 ft.

TEXAS PANHANDLE (DISTRICT 10) WILDCAT FAILURES

Hansford County: Gulf Oil Corp. 1 Gamertsfelder, 5-4-PSL, 13 mi. SW Spearman, dry, TD 9,214 ft., tops not reported, DST's 3,254-3,377 ft., 8,699-8,849 ft. 8,959-9,060 ft. produced weak blows for short periods, DST 9,114-9,214 ft., open 1 hr. and 15 minutes, produced strong blow but died last 10 minutes, recovered 1,400 ft. muddy salt water, plus 6,000 ft. salt water, no shows, flowing pressure 525-3,250 psi., elev. 3,271 ft.

Gulf 1 J. R. Collard, 7-3-SA&MG, dry, TD 8,665 ft.

SOUTH LOUISIANA

Magnolia to Reperforate In 1 Eugene Island Test

NEW ORLEANS — Magnolia Petroleum Co. is still testing the 1 Eugene Island, Block 125, on State Lease 693, St. Mary Parish. Hole is bottomed at 11,233 ft., with plugged-back total depth of 7,841 ft. Two drill-stem tests were made at the 7,300-02-ft. interval with no shows. Operators have squeezed perforations and will reperforate for a new test.

Shell Oil Co. is drilling below 15,619 ft. in the 1 Gall-Weeks Unit, Weeks Island area, Iberia Parish.

A new wildcat in the Lake Sand area of Iberia Parish will be spotted by Humble Oil & Refining Co. The new test will be the 1 State Lease 1706-West Cote Blanche Bay, and is projected to 12,500 ft.

Gulf Oil Corp. is drilling below 11,001 ft. in shale in the 1 Provost-Cyr Unit, 19-14s-7e, Weeks Island area, Iberia Parish, after setting 9⅝-in. casing at 10,997 ft. Projected depth of the hole is 14,500 ft.

Chicago Corp. stuck pipe in the 1 H. D. Broussard and had to junk the test at a total depth of 11,431 ft. The wildcat is located in fractional Section 12-11s-3e, Vermilion Parish. Test was originally scheduled to go to 13,000 ft.

Superior Oil Co. will cement the drill pipe in the hole at the A-1 State Lease 1565, wildcat approximately 27 miles offshore Cameron Parish, and will plug and abandon it. Operators struck a high-pressure salt-water flow at 8,600 ft. and decided to back off and leave the test.

In the same area, further to the west, Superior is perforating for production in the A-1 State Lease 1164, after well showed indications of being a new gas-condensate discovery.

The 11 new locations in South Louisiana include 1 wildcat start in Iberia Parish. There was one successful exploratory test completed in Jefferson Davis Parish, while one was dry in Vermilion Parish.

SOUTH LOUISIANA SUCCESSFUL WILDCAT

Jefferson Davis Parish: Gas-condensate discovery—Continental Oil Co. 1 R. A.

MERCOID

OFFERS A LINE OF DEPENDABLE CONTROLS FOR VARIOUS INDUSTRIAL REQUIREMENTS

THE ONLY 100% MERCURY SWITCH EQUIPPED CONTROLS. THEY ASSURE ACCURACY, BETTER PERFORMANCE AND LONGER CONTROL LIFE

Wherever the control of temperature, pressure, liquid level or mechanical operations are involved, Mercoid Controls and Switches assure a maximum in efficient and dependable performance.

PRESSURE CONTROLS
Available for numerous industrial applications. They are equipped with Bourdon tubes and have outside double adjustments which eliminate guesswork when setting controls. Indicators show the operating range on the calibrated dial.

REMOTE STEM TEMPERATURE CONTROLS
For control of liquids or gases, such as air, oil, water, paraffin, glue or distillate vapors and many other industrial applications. A heavy gauge Bourdon tube is employed which is actuated by the expansion of volatile liquid within the remote bulb. The control is equipped with convenient outside double adjustments.

LEVER ARM AND FLOAT CONTROLS
Mercoid lever arm controls have a variety of applications where it is desired to mechanically open and close electric circuits. Mercoid float controls are used for maintaining fluid levels in tanks or for control of sump pumps or cellar drainers.

LINE VOLTAGE THERMOSTAT
The No. 855 thermostat is used for line voltage applications where it is desired to handle the full motor load directly without the use of a relay. Available with "on-off" manual switch for unit heater applications. These thermostats are used for both heating and refrigeration applications.

TRANSFORMER-RELAYS
Type V is a reliable low voltage mercury contact relay which also acts as a transformer inducing low voltage (24 volts) on the pilot circuit. There is no hum or chatter. Used for all types of automatic equipment. Available in various voltages, cycles and circuits.

MERCURY SWITCHES
Mercoid brand switches are noted for their superior operating qualities. Various types available.

MERCOID CONTROLS are available in a variety of types for sensitive control of Pressure, Temperature and Lever actuation.

Write for further information.

THE MERCOID CORPORATION
4201 BELMONT AVE. ★ ★ CHICAGO, ILL.

Estes, 11-9s-5w, 1½ mi. NE flank of Welsh Dome, top sand 11,374 ft., TD 11,474 ft., perf. 11,374-87 ft., IP: 72 bbl. distillate per day, plus 2,453 M.c.f. gas per day, 12/64-in. choke, 41.4° grav., GOR 35,069, TP 3,100 psi.

SOUTH LOUISIANA WILDCAT FAILURE

Vermilion Parish: Chicago Corp. 1 H. D. Broussard, 12-11s-3e, dry, TD 11,431 ft.

CANADIAN FIELDS

Pincher Creek Test Ready to Run Intermediate String

CALGARY. — Canadian Gulf Oil Co. is readying its third Pincher Creek test well for a string of intermediate casing prior to drilling into its Madison limestone objective. The third venture, Gulf - Fred Shrempp No. 1, LSD 4, 35-3-29w4, is down flank on the structure, situated between the first two completions, about 2 miles northwest of the discovery and 5½ miles southeast of the Walter Marr No. 1.

Shrempp, drilled to 12,068 ft., is believed to be around 400 to 600 ft. from the Madison. Hole has been reamed and crew is preparing to run casing. As at Walter Marr, an intermediate string of protective casing will be run prior to drilling into the lime. The casing will be set around 5,500 ft. and cemented from top to bottom, and in the event high-pressure gas is encountered, the protective casing will serve as a safety measure.

The Pincher Creek discovery well and Walter Marr No. 1 results appear to confirm the presence of a major wet-gas field in this region. Whether or not crude oil will be found in volume may be determined by the Shrempp venture. The Marr, on tests run 2 weeks ago, rated a natural-gas flow rate conservatively calculated at 83,000,000 cu. ft. daily, plus an accompanying distillate flow rating 3,000 bbl. daily of 52.5° A.P.I. gravity product. The discovery well rated a potential of 55,000,000 cu. ft. daily and 1,500 bbl. daily of distillate.

This past week drilling bits completed hole at nine field development wells in Redwater and Leduc fields. Of this total there were an equal number successful in each field, and one failure at Redwater. New wildcat starts this week, totalling seven, are spread across the southern, central and northern plains of Alberta.

Imperial Oil, Ltd., dominant explorer and development explorer and development driller in Alberta, attained five of the new completions, three at Leduc and two at Redwater, all successful. Initial potential rates at the new producers ranged from 984 to 1,505 bbl. daily. Amerada Petroleum Corp. placed another Redwater completion on steady yield with an open-flow rate of 1,270 bbl. daily. Canadian Gulf Oil Co. started its tenth Redwater well on production with an initial rate of 1,101 bbl. daily. Calmar West Oils, Ltd., obtained its first production when its initial Leduc well showed an indicated potential of 1,920 bbl. daily from D2 zone. The one failure, at Redwater, was the Ed-Bridge Petroleum Co.'s first venture on a farmout from the Pacific-Sunray-Calvan-Princess team. The well was abandoned after contacting D3 zone below the water level.

Among the seven new exploratory tests proving for oil and gas horizons, four are located northeast of Edmonton. At Calahoo, around 30 miles southwest of Redwater, Imperial commenced drilling at its latest wildcat, located 6 miles east of the recent Imperial-Darling No. 1 abandonment. Petromine Exploration & Finance Co. has staked location for a test in the Saddle Lake area, 12 miles northwest of St. Paul. The Barnsdall-Honolulu-Seaboard team of American companies has started drilling near Vilna, on a Time Oils, Ltd., reservation around 70 miles northeast of Edmonton.

On the road, for example, it's as easy to drive as any ordinary truck. On the job, its control makes a hit with operators. MICHIGAN'S air ram clutches are fast and smooth . . . they take the work out of operating. My operators *like* those finger-tip air controls—and *I* know that they've paid off in faster, more efficient operation . . .

And then there's MICHIGAN'S *remote control*. When you pull onto the job, you're ready to go! There are no draglinks to disconnect, no adjustments to make. You can drive and steer from the turntable cab with the cab in any position. The turntable engine supplies the power.

Take all these easy-handling advantages together and you can see why I advise you to get a MICHIGAN!"

Write for Bulletin 100—
"On the Job with MICHIGAN"

DID YOU KNOW
you can buy
a brand new
MICHIGAN
TRUCK CRANE
complete with chassis
for as little as $10,250
F.O.B. factory*

MICHIGAN

MICHIGAN POWER SHOVEL COMPANY
225 Second Street, Benton Harbor, Michigan, U.S.A.

In South and Central Alberta three new exploratory tests are commencing. Royalite Oil Co. is starting a wildcat in the Ponoka area, about 120 miles north and 18 miles east of Calgary. Inland Oil & Gas Co., Ltd., of Edmonton has staked its third well near the Viking-Kinsella gas field of East Central Alberta. Hudson's Bay Oil & Gas Co. is starting another test at Winnifred, located about 13 miles southwest of the No. 1 well, in the Medicine Hat area of southeast Alberta.

CANADIAN WILDCAT FAILURES

Sun-Coronation Province No. 1, LSD 12-11-37-11w4, TD 3,641 ft.

Cal-Standard-Juno Prov. No. 44-6, LSD 7, 6-10-12w4, TD 2,419 ft.

Calmar Leduc-Oliver Lake No. 1, LSD 4, 15-50-21w4, TD 5,204 ft.

Royalite-Texaco Samson No. 1, LSD 5, 5-44-23w4, TD 6,433 ft.

TEXAS GULF COAST

Shallow Pool Is Opened By 1,384-Ft. Flowing Well

HOUSTON.—A new pool has been opened with the completion of Freeport Sulphur Co. A-2 fee, which is flowing 54.99 bbl. of oil per day through 9/64-in. choke from open hole, with 225 psi. tubing pressure. This is probably the shallowest flowing production in the nation. Total depth is 1,384 ft. with production from 1,360 to 1,383 ft. in gravel-packed open hole. Well is located 5 miles southeast of Freeport, 60 miles south of Houston, Brazoria County.

A new discovery prospect 4 miles north of Riverdale, Goliad County, is the Wood Oil Co. et al 1 Ramsey. Operators have set 5½-in. casing to 4,600 ft. for completion as a gas well in the Yegua zone. Hole is bottomed at 5,327 ft.

Ohio Oil-Melben Oil will make another try for crude production in the Texas tidelands, offshore from Matagorda County. Test will be the 1 State, Tract 403, approximately 12 miles southeast of Sargent in the Gulf of Mexico. The well will be drilled from a platform.

The East Village Mills field, Hardin County, considered the major discovery on the Texas Gulf Coast so far this year, has been extended in two directions. Houston Oil Co of Texas and American Republics Corp., discoverers of the pool, have completed the 2 Nona Fletcher Lumber Co., Brown Heirs Survey, for 247 bbl. of 41°-gravity oil per day through perforations at 7,060-68 ft. The operators now are drilling the 3 Nona Fletcher Lumber Co., 1,433 ft. east of the 2 Nona Fletcher Lumber Co.

Humble Oil & Refining Co. 1 Northington, wildcat in the Bonus area, A. Robb Survey, Wharton County, is coring below 10,290 ft. in sandy shale. A gas sand was logged from 10,101 to 10,110 ft. The test is projected to 11,100 ft.

The 59 new locations on the Texas Gulf Coast include 13 wildcat starts, one each in Chambers, Hardin, Matagorda, Wharton, Refugio and Wilson counties. There were 2 successful exploratory tests completed, 1 each in Lavaca and Live Oak counties, while 12 were dry, 1 each in Bee, Jackson, Refugio, Fort Bend, Grimes, Jefferson, Liberty, Walker, and Waller counties, and 3 in Wharton County.

TEXAS GULF COAST (DISTRICTS 2 & 3) SUCCESSFUL WILDCATS

Lavaca County: Oil discovery—Great Lakes Carbon Corp. et al 1 Alton C. Allen, in Wm. Bell Sur., 1 mi. E of Provident City field, 1½ mi. W of West Garwood field, top sand 6,110 ft., TD 6,157 ft., perf. 6,113-20 ft., IP: 103 bbl. oil per day, ⅛-in. choke, GOR 1,718, TP 1,490 psi., grav. 45°.

Live Oak County: Gas discovery—Tide Water Associated Oil Co. Geo. Maguglin, in J. Poitevent Sur. 37, 2¼ mi. E of Coquat field, top sand 8,180 ft., TD 8,546 ft., perf. 8,180-90 ft., IP: 3,817 M c.f. gas per day, ¼-in. choke, TP 2,600 psi., CP 3,025 psi.

TEXAS GULF COAST (DISTRICTS 2 & 3) WILDCAT FAILURES

Bee County: W. E. Fox, Tr., and Smith-Story-Wood Corp. 2 Scott E. McNeill, in Carmen Molino Sur., A-39, 7 mi. E of Beeville, dry, TD 3,222 ft.

Fort Bend County: Falcon Seaboard Drilling Co. et al A-1 A. R. Dillard et al, in M. M. Battle League, 2 mi. NW of Sugarland, dry, TD 8,544 ft.

Grimes County: R. N. Ranger & R. L. Kirkwood 1 I. P. Bradley, in M. D. Black Sur., A-6, 1 mi. N of Anderson, dry, TD 4,918 ft.

Jackson County: Hunt Oil Co. 1 M. N. F. Heynen, in Carlos Lasso League, 6 mi. S-SW of Edna, dry, TD 6,715 ft.

Jefferson County: Sun Oil Co. A-1 Broussard Trust, in N. E. Laidacker Sur., dry, TD 8,250 ft.

Liberty County: Rouse Exploration Drilling Co. 1 J. Hirsch et al, at So. Liberty, Wm. Duncan Sur., dry, TD 450 ft.

Refugio County: Dale W. Moore 1 Mrs. Jamie Hynes, in John Malone Sur., A-46, 3 mi. NW of Refugio, dry, TD 6,023 ft.

Walker County: L. M. York 1 K. S. Keeland, in L. M. Collard Sur., A-10, 1 mi. NW of New Waverly, dry, TD 4,200 ft.

Waller County: Sun Oil Co. 1 Von Blucher, at Clear Creek, in John Baker Sur., A-71, 9 mi. NE of Hempstead townsite, dry, TD 9,880 ft.

Wharton County: R. J. Caraway & Atlati Royalty Corp. 2 Weinheimer, in Wm. Vess League, A-349, 8 mi. NW of El Campo, dry, TD 5,402 ft.

Smith & Smith 1 P. P. Krenek, in E. Moore Sur., A-43, dry, TD 6,260 ft.

The New Regan Dualock Tubing Elevator

Tubing can never drop when you use this newly-designed elevator. Even if the door is not locked a positive-acting safety latch rotating with the lock keeps tubing locked within the elevator. Regular door lock has double locking faces. No other elevator has this patented two-way safety design. Body is a heat treated, solid alloy steel casting designed with a 4 to 1 safety factor. Engineered and produced to rigid Regan Standards. Pre-tested under every field condition. Now, proved in performance by users, the Regan *Dualock* Tubing Elevator is the number-one choice of operators who demand maximum safety. *Send Today for Detailed Bulletin.*

Regan Quality

Forge & Engineering Co.

SAN PEDRO, CALIF. HOUSTON, TEXAS

Exclusive Mid-Continent Representatives:
Hunt Tool Co.,
P.O. Box 1436, Houston, Texas

Exclusive Export Representatives:
Hunt Export Co., 19 Rector St., New York, N.Y.
Avda Pte., R. Saenz, Pena 832, Buenos Aires, Argentina

1-E

T. J. Ahern 1 Elmer M. Lyons, in ETRR Co. Sur. 29, A-137, 3½ mi. S of El Campo, dry, TD 6,492 ft.

OKLAHOMA

Second Pay Zone Proved To Reopen Tecumseh Pool

AFTER producing from the Dolomite since 1937, Stanolind Oil & Gas Co. 1-B Billington, SW SE SW 32-9n-3e, discovery well and to date the only producer in the Tecumseh pool, Pottawatomie County, has been plugged back to the Hunton lime, and with casing perforated in that horizon, flowed 5 bbl. of oil per hour and an estimated 1,500,000 cu. ft. of gas per day through ¼-in. choke to prove a second pay zone for the area.

Casing first was perforated at 4,792-98 ft., from which interval the well flowed at the rate of 3,000,000 cu. ft. of gas per day. Shut in, it built up a pressure of 1,800 psi. at the surface and had a bottom-hole pressure of 2,100 psi. Casing then was perforated at 4,884-4,901 ft., 4,912-17 ft., and 4,955-60 ft., and the formation given an acid treatment of 1,000 gal. Opened, the well unloaded and cleaned in 35 minutes, after which it flowed 32½ bbl. of oil in the first hour through 1-in. tubing choke with a gas-oil ratio of 28,140 cu. ft. per barrel and pressure of 1,300 psi. on the tubing and 1,760 psi. on the casing. With flow pinched to 5 bbl. an hour through ⅛-in choke the pressure was 760 psi. on the tubing and 1,720 psi. on casing.

In its original completion in the Dolomite, the well had been drilled to a total depth of 5,320 ft. in the Wilcox topped at 5,316 ft., and the hole plugged back to 5,230 ft. with 7-in. casing at 5,110 ft. from that zone, it flowed initially at the rate of 557 bbl. per day. Present plugged back depth in the Hunton is 5,020 ft. Top of the Hunton is 4,789 ft.

In Hughes County, a new gas-distillate pool appears to have been found by Joe Josephson and V. E. Autry in their 1 Claude Meadows, NE NE SE 14-9n-12e, which flowed at an estimated rate of 25,000,000 cu. ft. of gas daily and recovered 3 gal. of distillate in a drill-stem test at 3,440-96 ft. in Cromwell sand, topped at 3,430 ft. Flowing pressure was 1,250 psi. and bottom-hole pressure 1,500 psi. Casing has been run to the top of the zone tested. The well is 2 miles southwest of Dustin.

Another new pool for Hughes County also is indicated in W. A. Delaney, Jr., 1 Logsdon, NW SE NW 2-8n-9e, which recovered 120 ft. of oil and some additional oil-cut mud in a drill-stem test of Cromwell sand at 3,316-21 ft., and in which casing has been run for production tests. It is west of Wetumka and about midway between the Long and Fuhrman pools.

Four miles east of McAlester, in Pittsburgh County, Index Oil Co. has a small gas discovery in its 1 Welsh Unit, C NW SW 35-6n-15e. It flowed an estimated 1,000,000 cu. ft. of gas per day from Atoka sand (Pennsylvanian) at 1,151-85 ft. after drilling to a total depth of 2,010 ft. Sand at 1,164-85 ft. was shot with 150 qt. Hole was drilled with cable tools and is open below 300 ft., where 10-in. casing was run. A second well, 1 Dupuich, SE NE SE 35-16n-15e, about ¾ mile west of the discovery, has been started.

OKLAHOMA SUCCESSFUL WILDCATS

McClain County: New pool, East Bradley—Cities Service 1 Dacus, C NW SW 29-5n-4w, flowed 88 bbl. of 44.2°-gravity oil per day from first bromide sand at 11,180-11,675 ft., TD 11,760 ft.

Stephens County: Kingery 1 Weedn, SW SW SE 3-2s-6w, pumped 85 bbl. of 39.5°-gravity oil per day from dolomite at 4,776-4,863 ft., TD 4,868 ft.

New pay in South Palacine—Sunray Oil Corp. 4 Nichols, SE NW NE 21-2s-6w, flowed 96 bbl. of 36°-gravity oil per day from Arbuckle at 2,625-52 ft., TD.

OKLAHOMA WILDCAT FAILURES

Caddo County: Superior 33-18 Cogdill, NW SE NW 18-8n-11w, dry, TD 10,983 ft., Pontotoc 4,175 ft., Cisco 5,885 ft., Rowe 6,738 ft., Nyles 7,137 ft., Hoxbar 7,355 ft., lower oolitic 7,879 ft., Wade 8,000 ft., Headland 8,458 ft., Medrano 8,780 ft., upper March 9,196 ft., Deese 10,880 ft.

Carter County: Blaylock 1 Goddard, SW NW SE 21-1s-2w, dry, TD 5,134 ft. in Viola.

Cotton County: Kewanee 1 He-ne-ni-yah, SW SW NW 11-4s-11w, dry, TD 2,006 ft., Megargel 1,930-53 ft.

Garvin County: Carlock 1 Hostetter, NW NW SE 27-3n-3e, dry, TD 2,933 ft., basal Pennsylvania-Hunton 1,762 ft., Sylvan 2,051 ft., Trenton Viola 2,304 ft., bromide dense 2,488 ft., first bromide sand 2,803 ft., second bromide sand 2,825 ft., sandy dolomite 2,882 ft. and 2,908 ft.

Grant County: Conhaim 1 Killiam, NW NW SE 17-28n-5w, dry, TD 5,408 ft., Mississippi chat 4,770 ft., Mississippi lime 4,780 ft., Woodford 5,307 ft., no Viola, Simpson dolomite 5,348 ft., Wilcox 5,393 ft.

Jefferson County: Wilcox 1 Harrison, SE NW SE 14-5s-7w, dry, TD 2,018 ft., granite wash 1,087-95 ft., sand 1,192-99 ft., 1,444-50 ft., 1,500-05 ft., 1,545-60 ft., and 1,707-22 ft., granite wash 1,766-69 ft.

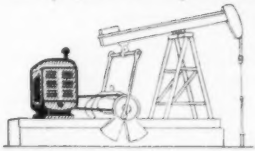
Kay County: Brown & Tomer 1 Whitmore, NE NE SE 15-27n-2e, dry, TD 1,651 ft.

Logan County: Derby Oil 1 English, NE NW NE 16-16n-2w, dry, TD 5,880 ft., Prue 5,175 ft., Mississippi lime 5,326 ft., Woodford 5,340 ft., Hunton 5,408 ft., Sylvan 5,430 ft., Viola 5,528 ft., dolomite 5,676 ft., Wilcox 5,705 ft., second Wilcox 5,788 ft.

Okfuskee County: Davidson et al 1-A Hicks.

WHIZ MOTOR RYTHM*

The perfect Blend for Oil Field Operations



WHIZ MOTOR RYTHM is the superior additive for crankcase oil, fuel oil, mechanical top oilers. It is used and recommended by leading manufacturers for oil field, truck and motor equipment.

Sludge—gum—varnish—carbon—rust—corrosion and other harmful deposits that rob motors of power and pep disappear like magic when WHIZ MOTOR RYTHM is used.

Engines start quicker—run smoother—last longer with WHIZ MOTOR RYTHM. Add it to your engines! *Write for free sample!*

Non-Inflammable Degreaser

WHIZ HO-ZOF

Cuts degreasing time, work, and cost in half. Ideal for cleaning rigs, motors, tanks, or other equipment.

Water Pump Lubricant

WHIZ COMMANDO RUST PREVENTIVE

Offers double protection against corrosion—stops formation of rust, scale and sludge in liquid cooled engines.

*Reg. U. S. Pat. Off.

Whiz

PRODUCTS OF *Hollingshead*

LEADER IN MAINTENANCE CHEMICALS

R. M. HOLLINGSHEAD CORPORATION • GENERAL OFFICES: CAMDEN, NEW JERSEY

CANADIAN OFFICES: TORONTO • WAREHOUSES: DALLAS, SAN FRANCISCO, CHICAGO

Illustrated Guide to steam-cleaning —yours FREE!

Here's a helpful guide that shows you how Oakite Steam-Detergent Cleaning can save time and money on your cleaning jobs.

This Oakite guide gives full details about the various scientifically designed Oakite Solution-Discharging Steam-Guns and the low-cost easy ways to install them. Tells how to make up solutions for cleaning and paint-stripping with designed-for-the-job Oakite compounds. Shows how you can simplify such jobs as cleaning pump and drilling equipment; rotary tables, mud hogs, crown blocks, swivels and the like.

JUST SAY THE WORD and we'll mail you a copy of this guide. Or ask your neighborhood Oakite Technical Service Representative for a FREE copy.

OAKITE PRODUCTS, INC.
44C Thames Street, NEW YORK 6, N. Y.
Technical Service Representatives Located in Principal Cities of United States and Canada

OAKITE
Trade Mark Reg. U. S. Pat. Off.
SPECIALIZED INDUSTRIAL CLEANING MATERIALS • METHODS • SERVICE

Everything Electrical
for the
OIL INDUSTRY

You'll save time and trouble if you order all of your Electrical Supplies from Nelson . . . Call 5-1241 Tulsa!

When it's Electrical
NELSON
ELECTRIC SUPPLY CO.
TULSA, Detroit & Cameron

NW NE NW 30-12n-10e, dry, TD 3,288 ft., Inola 2,875 ft., Bartlesville 2,878 ft., Gilcrease 3,125 ft., Union Valley-Cromwell 3,264 ft.

Oklahoma County: Altus Drilling Co. 1 White, C SE NW 1-12n-2w, dry, TD 6,670 ft., Hogshooter 4,904 ft., Checkerboard 5,222 ft., conglomerate 5,374 ft., Oswega 5,780 ft., no Bartlesville, no unconformity sand, basal Pennsylvanian-Haragan 6,096 ft., Sylvan 6,288 ft., Viola 6,402 ft., dense 6,434 ft., Wilcox 6,536 ft., sandy dolomite 6,638 ft., second Wilcox 6,646 ft.

Rumley et al 1 Mappes, NE NE SW 26-13n-3w, dry, TD 6,550 ft.

Okmulgee County: Jackson et al 1 Willard, NW NW SE 23-11n-12e, dry, TD 1,300 ft., sand 1,270 ft.

Payne County: Berry 1 Dawes, SW SW NW 24-19n-5e, dry, TD 3,255 ft., Osage Layton 1,680 ft., Hogshooter 2,019 ft., Checkerboard 2,355 ft., Peru 2,665 ft., Big lime 2,707 ft., lime 3,030 ft., Inola 3,135 ft.

Pottawatomie County: Barrett et al 1 Eaves, SW NE SE 10-10n-2e, dry, TD 6,070 ft., Mayes 5,382 ft., Woodford 5,560 ft., Hunton 5,626 ft., Sylvan 5,704 ft., Viola 5,805 ft., dense 5,854 ft., dolomite 5,896 ft., Wilcox 5,948 ft., second Wilcox 6,028 ft.

Stephens County: Shear 1 Burkes, SW SE NW 22-2s-6w, dry, TD 2,955 ft., Arbuckle 2,895 ft.

LA.-ARK.

Wilcox Sand Being Tested In New Joyce Area Well

SHREVEPORT.—In the new Joyce area of Winn Parish, C. M. Bagley 1 Tremont Lumber Co. reported Wilcox sand with oil shows and porosity, and was testing. The well had top of the Wilcox at 1,112 ft., and total depth at 1,121 ft. Cores at 1,104-09 ft. recovered 5 ft. of sand with no shows, and 1 ft. of sandy shale with oil shows. From 1,109-12 ft. there was 1 ft. of shale and 1 ft. of sand with oil show, and at 1,112-15 ft. and 1,115-18 ft. the recovery was porous oil sand. Location of the well is NW NW SW 25-12-2w. E. M. Self 1 Tremont, in SE NE NE 26-12n-2w, spudded and was waiting on cement.

Field reports on exploratory wells, which have shown a steady decline over the past several weeks, included the following: In Bossier Parish, Scooter Drilling Co. 1 Thigpen-Herold, NW NE NW 15-20n-13w, was shut down for orders at 2,730 ft., in the Cretaceous. It is a new wildcat, looking for the Paluxy around 2,900 ft. Union Producing Co. 1 13-Unit, 13-17n-12w, Cotton Valley exploration in the Sligo field, was coring sand and shale of the Travis Peak, at 6,450 ft. It had the Sligo zone at 4,828 ft., and top of the Travis Peak at 5,360 ft.

Carter Oil Co. 1-B Louisiana Central Lumber Co., 4-9n-6e, Catahoula Parish, was drilling below 3,775 ft. It entered the Wilcox at 2,982 ft.

Ohio Oil Co. and Gulf Refining Co. 1 O. L. Martin, Smackover wildcat in 3-22n-7w, Claiborne Parish, was drilling ahead in the lower Glen Rose at 5,298 ft. Samples placed the Massive anhydrite at 4,170-4,392 ft. Haynes B. Ownby Drilling Co. 1 Malone, 36-21n-6w, was in the lower Glen Rose at 4,602 ft. It was scheduled to the Travis Peak.

E. C. Laster 1 C. F. Grimes, 26-15n-14w, 3 miles southeast of Stonewall, had total depth at 5,295 ft., in the Rodessa, and was waiting on cement. Cores from 5,110-60 ft. recovered 50 ft. of lime and shale, showing light oil shows throughout. Cores from 5,160-5,200 ft. had no shows.

NORTH LOUISIANA WILDCAT FAILURES

Bossier Parish: McKinnon, Henderson and Cherry 1 Lodwick Lbr. Co., 25-20n-11w dry, TD 3,435 ft., Nacatoch 1,595 ft., Saratoga 1,952 ft., Blossom 2,553 ft.,

Tokio 2,685 ft., Paluxy 3,235 ft., elev. 233 ft.

Union Parish: Sklar Oil Co. 1 G. L. Risinger, 10-23n-2w, dry, TD 2,218 ft. in chalk.

ARKANSAS WILDCAT FAILURES

Nevada County: H. B. Brown 1 H. H. McKenzie, SE SW SE 26-14s-22w, dry, TD 3,511 ft.

Union County: Lion Oil Co. 1 J. T. Loftin, SW NE 34-18s-18w, dry, TD 8,515 ft., Glen Rose 3,359 ft., Massive anhydrite 3,394-3,550 ft., James 4,151 ft., Hogg sand 4,414-21 ft., Travis Peak 4,620 ft., Cotton Valley 6,058 ft., Buckner 8,352 ft., Reynolds 8,492 ft., porosity 8,506 ft., elev. 207 ft., DST 8,500-15 ft., open 15 minutes, made fair blow, recovered 1,800 ft. of water.

SOUTHWEST TEXAS

Guadalupe County Wildcat Completed as Producer

CORPUS CHRISTI.—J. M. Turkel 2 J. B. Burns, wildcat in the Samuel Highsmith Survey, 4 miles west of Luling, Guadalupe County, has been completed from open hole, and is flowing into tanks for potential gage. The new discovery is completed in the Austin chalk at 2,225-73 ft. with 7-in. casing set to 2,267 ft. On drill-stem test at 2,225-67 ft., prior to setting pipe, the well recovered 1,260 ft. of 38°-gravity oil in 11 minutes and developed 200-psi. working pressure.

A new pool has been opened in Nueces County with the completion of Grace Oil Co. 1 Doughty, which flowed 76 bbl. of 32.2°-gravity oil per day through ⅛-in. choke, with 200-psi. pressure on the tubing and 265-psi. pressure on the casing. The well originally was drilled to 7,616 ft. and abandoned by Bering Co. and C. Andrade, III. Operators perforated with 38 shots at 4,496-504 ft. for completion.

Humble Oil & Refining Co. 1 Ruth Harlan, wildcat 13 miles northwest of Dilley, Frio County, recovered 37 ft. of oil-cut rat-hole mud with stains and flakes of free oil on 40-minute drill-stem test at 5,700-20 ft.

Six miles west of Riviera, Humble 1 King Ranch Canelo, Kleberg County wildcat, is drilling below 5,500 ft. On 25½-minute drill-stem test at 5,212-22 ft., the well recovered 140 ft. of oil and 16 ft. of gas-cut mud through 3/16-in. and 1-in. chokes. Average surface pressure was 24 psi.

Danciger Oil & Refining Co. 1 Mrs. S. Ballard, southeast offset to the new Rudman field discovery, recovered 180 ft of gas and distillate-cut mud on 12-minute drill-stem test at 804-20 ft., and developed 475-psi. pressure. Operators are drilling ahead.

The 24 new locations in Southwest Texas include 5 wildcat starts, one each in Zapata, McMullen, and Milam counties and 2 in Frio County. There were two successful exploratory tests completed, one each in Hidalgo and Nueces counties, while six were dry, one each in Caldwell, Dimmit, Brooks, Jim Wells, Webb and Zapata counties.

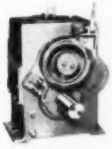
SOUTHWEST TEXAS (DISTRICTS 1 & 4) SUCCESSFUL WILDCATS

Hidalgo County: New gas discovery—Sinclair Prairie Oil Co. 1 John Jancik, Block 16, Porcion 72, 3½ mi. W of Alamo gas field, top sand 6,575 ft., TD 9,215 ft., perf. 6,575-640 ft., IP 7,000 M.c.f. gas per day, open flow, SIP 2,610 psi.

Nueces County: New oil discovery—Producers Development Co. 1 Veronica McCullough, 1 mi. SE of Richard King field, top sand 5,538 ft., TD 5,594 ft., perf. 5,538-48 ft., IP: 7.5 bbl. oil per day, open flow, TP 25 psi., grav. 38, GOR 6,400.

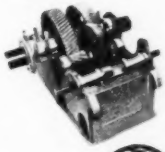
RIGHT GEARS SAVE DOLLARS

Are you sure your equipment doesn't include *even one* inefficient belt, chain, or gear drive? Just one can cost you needless dollars



...IN DRILLING

New, special Pacific-Western transmissions are now available to reduce power and time costs.

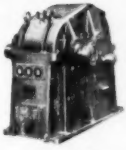


...IN PUMPING

Pacific-Western speed reducers designed especially for oil field service save maintenance dollars.

...IN STRIPPING

Operating costs on old wells can be cut to the absolute minimum by installing Pacific-Western bandwheel drives.



...IN PIPELINE SERVICE

A complete line of Pacific-Western high-speed units is available for reliable service on pipelines.

Reduce Overhead and increase production by the correct application of gears and geared products that are specifically engineered for the oil industry. Our nearest office or plant will be glad to help.

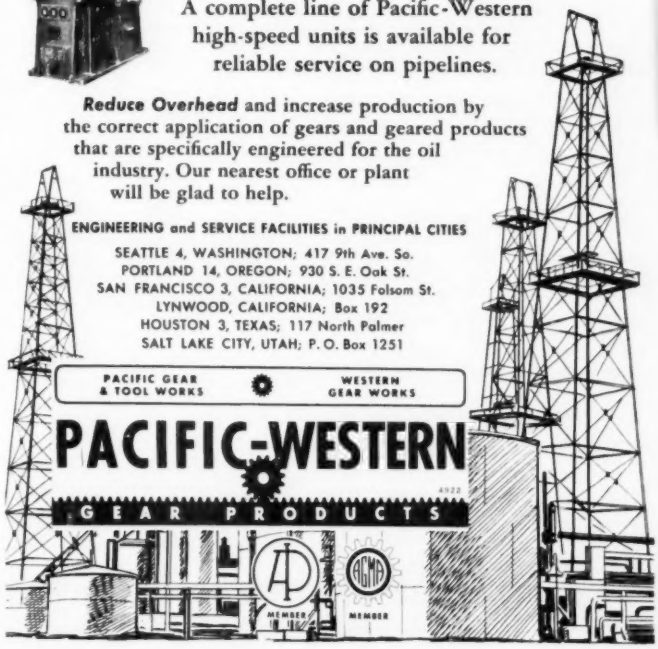
ENGINEERING and SERVICE FACILITIES in PRINCIPAL CITIES

SEATTLE 4, WASHINGTON; 417 9th Ave. So.
PORTLAND 14, OREGON; 930 S. E. Oak St.
SAN FRANCISCO 3, CALIFORNIA; 1035 Folsom St.
LYNWOOD, CALIFORNIA; Box 192
HOUSTON 3, TEXAS; 117 North Palmer
SALT LAKE CITY, UTAH; P. O. Box 1251

PACIFIC GEAR & TOOL WORKS — WESTERN GEAR WORKS

PACIFIC-WESTERN

GEAR PRODUCTS



SOUTHWEST TEXAS (DISTRICTS 1 & 4) WILDCAT FAILURES

Brooks County: I. K. Howeth 1 Kathleen Hocker Alexander, in Las Megueyes de Palo Blanco Grant, 3 mi. SE of Sejita, dry, TD 4,168 ft.

Caldwell County: Riddle Oil Co. 2 A. J. Miears, in C. M. Cannon Sur., 4 mi. SW of Dale, dry, TD 2,462 ft.

Dimmit County: John Hamman, Jr., and C. G. Dunwoody, Jr., 1 Alamo Lumber Co., in T&NO Sur. 1, Block 3, A-767, dry, TD 3,525 ft.

Jim Wells County: Bridwell Oil Co. 1 Richard King, in Block 12, Richard King Farm Lots, 7 mi. NW of Agua Dulce, dry, TD 6,010 ft.

Webb County: Amman & McNab, Ltd., 1 Rosa Vela Benavides, in Lot 6, Sam Cunningham Subd., Santa Thomas Grant, 25 mi. N-NW of Laredo, dry, TD 3,875 ft.

Zapata County: Dulaney Oil Co. 6 Alice Doran Haynes, in Villa Grant, A-106, 1½ mi. S of Comitas field, dry, TD 1,026 ft.

CALIFORNIA

Ventura Avenue Field Gets New Producers

LOS ANGELES. — Four new D-7 zone wells were brought in at Ventura Avenue field. The deepest is Shell Oil Co. 4 Hartman Ranch with total depth of 12,800 ft. Initial production was 423 bbl. per day, 16 per cent cut. Production is through casing perforations at 11,925-12,354 ft., and 12,385-12,678 ft. The other producers are: Lloyd Corp. 30 L.C.; Shell Oil Co. 300 Taylor; Tide Wate Associated-35 Hartman.

In the same field, 1 Barnes-Sparks of Wright and Lohman came in flowing 1,200 bbl. per day from the D-6 zone in Section 21-3n-23w, total depth 11,698 ft.

Placerita now stands as the most active drilling area in the state, and additional leasing is under way. Production remains high for most of the wells but reports persist that the water cut is showing a sharp increase. In Section 31-4n-15w of the proven area, Ramon Somavia has set location for nine new wells. Also on Somavia property, Tevis Morrow has contracted with Pike Drilling Co. to put down 20 wells. The B. F. De Lanty wildcat in Placerita, 28-4n-15w, is drilling beyond 1,550 ft. There are reports of shows in the ditch, and if productive, this well, the 1 Nadeau, would give a sharp northeast extension to present activity in the area.

A half mile north of Summerland production, Standard of California has swabbed crude from its 1 Ortega Community. The well was drilled to 5,987 ft. It is now plugged at 2,400 ft. General Petroleum reports its 1 Las Posas McBean in the Somis area, Ventura County, dry. The well bottomed at 9,196 ft. but a formation test at 9,003-82 ft. failed. Location is 34-3n-20w.

Richfield Oil's test, the 1 Plieto Hills, 6-10n-20w, Kern County, reached grey sand at 5,070 ft. The well is now plugged at 4,600 ft. and will be redrilled. The site is 3 miles south of Wheeler Ridge production and near two abandoned Independent Exploration wells that bottomed at 7,096 ft. and 4,000 ft.

Brazos Oil & Gas Co. is reentering its 1 Brown in the Rio Vista area of San Joaquin County. This well was recently abandoned at 5,500 ft. The site is about 10 miles southwest of Tracy in 22-4n-4e.

A mile north of Newhall, Los Angeles County, General Petroleum is continuing tests in its 1 Circle J, 26-4n-16w. Bottom is at 6,560 ft. with present tests being made in the 200-ft. interval above a plug at 5,950 ft. Swabbing has produced a little salt water with a scum of oil. Higher formations will also be tested.

CALIFORNIA WILDCAT FAILURES

Fresno County, Burrel area: L. M. Lockhart 6-35 Postal Union, 35-16s-18e, dry, TD 6,700 ft., redrilled to 6,560 ft., elev. 215 ft.

Raisin City area: C. W. Colgrove 71-5 Nevada Cattle, 5-16s-18e, dry, TD 7,039 ft., elev. unknown.

Kern County, Devils Den area: Tritex Oil Co. 1 Tritex-Porter, 16-25s-18e, dry, TD 2,916 ft., elev. 680 ft.

Tehachapi area: H. J. Kirschenman and A. J. Rogers 1 Cummings Valley, 19-32s-32e, dry in granite, TD 820 ft., elev. 4,006 ft.

Tejon area: Von Glahn Oil Co. 1 Tejon, 32-22s-16e, dry, top granite 2,590 ft., TD 2,626 ft., elev. 735 ft.

Temblor area: Western Petroleum Co. 71-30 W. P. How, 30-29s-21e, dry, top Point of Rocks 4,200 ft., TD 4,262 ft., elev. 1,108 ft.

Los Angeles County, Placerita area: Range Oil Corp. and Lee A. Ault 1 Dorothy, 32-4n-15w, dry, TD 1,649 ft., elev. 1,575 ft.

San Benito County, Ciervo area: W. P. Lasher and Charles Schmitz 4 Valacitos, 33-16s-11w, dry, TD 2,228 ft., elev. 1,854 ft.

San Luis Obispo County, Carrizo Plains area: Union Oil Co. 6 Wreden, 15-29s-16e, dry, TD 2,608 ft., elev. 1,577 ft.

Union Oil Co. 7 Wreden, 1-29s-18e, dry, TD 3,700 ft., elev. 2,513 ft.

Guadalupe area: Continental Oil Co. A-3 LeRoy, 12-10n-35w, dry, TD 4,053 ft., elev. 30 ft.

Santa Barbara County, Cuyama Valley area: Richfield Oil Corp. B-1 Homan, 23-10n-28w, dry, TD 3,412 ft., elev. 3,049 ft.

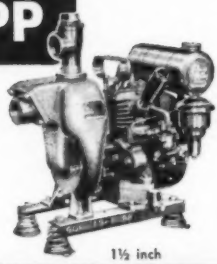
Solano County, Vacaville area: Tolinos Oil & Gas Co. 1 Tavalaro, 17-5n-1w, dry, TD 1,175 ft., elev. unknown.

Tulare County, Tipton area: Jack Herley 1 Tipton Comm., 15-22s-24e, dry, TD 2,804 ft., elev. 254 ft.

Ventura County, Sespe area: C. W. Colgrove 88-13 Goodenough, 13-4n-20w, dry, TD 3,432 ft., elev. 1,210 ft.

Depend on GORMAN-RUPP

Lightweight PUMPS



1½ inch

FOR LARGE CAPACITY
THE "MIDGET"
Wt. 62 lbs. -- 3300 GPH

1½ inch

FOR HIGH PRESSURE
MODEL 1103
Wt. 60 lbs. -- 3600 GPH

¾ inch

FOR LIGHT ALL-PURPOSE
THE "HANDY"
Electric motor driven
Weight 20 lbs.--1000 GPH

Gorman-Rupp self-priming centrifugal pumps are especially designed to meet the toughest requirements of the oil fields. A product of advanced engineering design, yes -- but retaining the same simplicity of construction that has made Gorman-Rupp so outstanding in other fields.

The applications of these pumps around a lease are too numerous to mention. You can get a Gorman-Rupp in any size or capacity to suit your particular requirements.

Gorman-Rupp guarantees satisfaction. No other pump on the market will do more work for its size, power or weight, or for as long a period of time without attention or maintenance. Every pump tested.

Ask for further information and special pump bulletins.

Mid-Continent Oil-Field Representative

TOM L. TURNER
930-A ESPERSON BLDG.,
HOUSTON 2, TEXAS

THE GORMAN-RUPP COMPANY
336 North Bowman St., Mansfield, Ohio

AXELSON FIRST CHOICE

YOU CAN ARGUE QUALITY AT THE SURFACE

but it's PROVED at the bottom of the well

Half a century of practical oil field experience has proved that deep well pump liners must be made to the highest quality. Complete foundry facilities are maintained by Axelson to insure that only the finest of materials are used in AXELSON Liners.

AXELSON REGULAR CAST IRON LINERS are made of alloy gray cast iron, normalized and precision machined under rigid control to the highest standards of workmanship, assuring longer life under normal pumping conditions.

AXELSON HARDENED CAST IRON LINERS are made of an alloy of gray cast iron, hardened and tempered in AXELSON'S automatically temperature-controlled electrical furnaces. This results in high strength, toughness and hardness which offers high resistance to abrasion and corrosion giving greater efficiency, lower lifting cost and longer life.

AXELSON DUAX LINERS are produced by a new process whereby a highly alloyed iron, hard as tool steel, is centrifugally cast and bonded within a seamless steel shell. The extremely hard inner surface offers amazing wear resistant qualities, and is recommended for service where the most difficult and adverse corrosive and abrasive conditions exist.

AXELSON FIRST CHOICE
in sucker rods, deep well plunger pumps, pumping components and hydraulic long stroke pumping units.

DEEP WELL PUMP

AXELSON *Liners*

THERE IS NO ECONOMICAL SUBSTITUTE FOR QUALITY

AXELSON MANUFACTURING CO. • PLANTS—Los Angeles 11; St. Louis 16 • OFFICES—New York City 7; Tulsa 1; Buenos Aires, Argentina; Caracas, Venezuela • DISTRIBUTORS—Jones & Laughlin Supply Co.; Great Northern Tool & Supply Co.; Industrial Agencies, Ltd., San Fernando, Trinidad, B.W.I.; Industrias Waldrip & Campbell, Barcelona and Maracaibo, Venezuela.

NOW IN STOCK
AT OUR
DALLAS
WAREHOUSE

"SURE-GRIP"
SHEAVES
WITH
INTERCHANGEABLE HUBS

COMPLETE STOCK AVAILABLE FOR IMMEDIATE SHIPMENT. Split-tapered and one-piece flanged hubs are easy to mount and quick to remove. Retain the hub and change the sheave to suit the speed, or change the hub to fit shaft and retain the sheave.

Write for details today

We also stock: "Sure-Grip" Pulleys with interchangeable hubs; "Sure-Grip" V-Belts and Complete Drives; Pulleys, Couplings, Collars, Bearings and Pillow Blocks.

T. B. WOOD'S SONS CO.
1117 W. COMMERCE ST., DALLAS, TEXAS.

The Shamrock
HOUSTON

"America's Magnificent Hotel"

Enjoy the comfort of *extra space* in your room . . . individually controlled air-conditioning . . . the superb Shamrock pool . . . big-name entertainment — *currently, Glen Gray and his Casa Loma Orchestra* . . . all at most reasonable prices for such uncompromising excellence. *Single rooms at $6.00.*

Make your Houston reservations at the Shamrock

Every guest is invited to enjoy the enormous Shamrock pool — the gay Aquatic Terrace.

GLENN McCARTHY, PRESIDENT

PERMIAN BASIN

35 Rigs Running in Scurry County Area

MIDLAND.—Scurry County development and wildcat drilling on the reef limestone structure north and south of Snyder continues to grow in size and importance. At last report there were 35 rigs running in the area. Offset drilling obligations, as well as the large number of interested operators, are contributing factors in the rapid development.

Outcome of wildcats now drilling to the north of North Snyder field will have an important bearing on further development. While the structure, as known so far, drops off rapidly to the north and south of the two main producing areas, recent completions in the Kelly area to the south lend encouragement to drillers of what, at this time, may appear to be edge wells.

The Kelly field is low on structure, with only about 50 ft. of pay as compared with the 700-750-ft. section in the main area at North Snyder, but completion potentials have far surpassed the discovery well. The high potentials are due in part to larger choke sizes; nevertheless, the wells are held in a much more favorable light. According to observers, if the structure holds out as well on the north side of the field as it has in the Kelly area, it will offer a vast area to future exploration.

Bert Fields, Dallas, completed the 1 A. B. Eicke as a ¾-mile southwest extension to the Kelly field for a 24-hour flowing potential of 975 bbl. of 40°-gravity oil, through ½-in. choke. Completion was made without acid, from bottom of 7-in. casing at 6,761 ft. to 6,791 ft., total depth. There was no formation water. Flowing pressures were 735 psi. on casing and 500 psi. on tubing. Gas-oil ratio was 890 cu. ft. Location of the well is CE½ NE NE 205-97-H&TC.

Fields also completed a north and west extension well to the Kelly area at his 1 P. T. Harmon, SE NE 210-97-H&TC, which rated a daily potential of 1,008 bbl. of 40°-gravity oil, flowing naturally through ½-in. tubing choke. Top of pay was 6,725 ft., with 7-in. casing set to 6,734 ft. Total depth was 6,761 ft. Flowing pressures were not reported, but gas-oil ratio was 821 cu. ft. The two wells are the best producers in the area at this time.

Guy Mabee Drilling Co. was preparing to move in materials at Sunray Oil Corp. 1 L. S. Sentell, a 7,000-ft. wildcat 7 miles north and a little east of Snyder. Location is 467 ft. from north and west lines of Tract 2, Dallas Trust & Savings Bank subdivision of the Grimes ranch, in Section 22, Block 1, J. P. Smith Survey. The drill site is about 2 miles east of the nearest drilling well on the southeast side of the North Snyder field.

Standard Oil Co. of Texas 1 Earl Reinhart, Block 1, J. P. Smith Survey, on the southeast edge of the south extension field, reported top of the reef at 6,340 ft., or minus 3,909 ft. That marker was said to be 131 ft. high to Sunray Oil Corp. 1 Brown, discovery well for the area. At last report the 1 Reinhart was drilling at 6,459 ft.

Tide Water Associated Oil Co. 2 R. H. House, on the southeast side of the field, completed for a natural flowing potential of 1,128.6 bbl. of oil in 24 hours, through ¾-in. choke, from open hole between 5½-in. casing at 6,548 ft. and total depth of 6,658 ft. Flowing tubing pressure was 200 psi. Location of the well is 1,867 ft. from west and 467 ft. from south lines, Section 384-97-H&TC.

On the field's southwest side, Lipscomb & DeLange completed 3 A. L. Wren, 467 ft. from north and west lines, Tract 11, Section 20, Block 1, J. P. Smith Survey, for a daily potential of 472 bbl. of 44°-gravity oil. The flow was natural, through 5/16-in. choke, with gas-oil ratio of 960 cu. ft. Production was from open hole at 6,840-6,990 ft.

According to field sources, Superior & Intex 1 R. H. Jordan, extreme northwest Scurry County wildcat which has been held up by legal trouble, completed on the pump for 47.3 bbl. of 39.8°-gravity oil, plus 29.7 bbl. of sediment and water. The well was producing from perforations in casing at 8,220-60 ft., in what is believed to be Mississippian.

Andrews County.—George P. Livermore, Inc., and Deep Rock Oil Corp. 1 Mayhew, Ellenburger wildcat 5 miles north of the Dollarhide field in 20-A51-PSL, ran a 1-hour drill-stem test in the Montoya section from 10,821-11,018 ft., which recovered the 2,000-ft. water blanket and 4,750 ft. of muddy sulfur water. It was to drill ahead.

Upton County.—Republic Natural Gas Co. 1 V. J. Powell, 2 miles southeast of the Pegasus field, ran a drill-stem test in the Devonian at 12,014-116 ft. Using a 2,000-ft. water blanket, gas showed in 2 hours and 18 minutes, estimated at 20,000 cu. ft. daily. Recovery was the water blanket, cut with gas, and 270 ft. of gas and distillate-cut drilling mud.

Magnolia Petroleum Co. 1-36 Glass, southwest offset to the discovery, was drilling below 11,312 ft. in lime. Magnolia's 2-30 Glass, northeast offset (Midland County), was drilling below 11,657 ft.

Three miles southwest of the field, Humble Oil & Refining Co. 1 Mrs. Z. Oswalt was drilling sandy lime at 7,890 ft.

WEST TEXAS (DISTRICTS 8 & 7-C) WILDCAT FAILURES

Crockett County: D. D. Thomas 1 Archie Bean, NW NW NW 28-UV-GC&SF, 4 mi. SW Vaughn field, dry, TD 1,446 ft., sulfur water 1,382 ft.

Schleicher County: Morgan, Aikman & Co. 4-E Jess Koy, NE NW 37-L-GH&SA, dry, TD 5,850 ft., Strawn 5,590 ft., elev. 2,299 ft.

Morris & Scherck 1 T. R. Henderson, Sec. 8, Blk. V-28, R. A. Brantley Sur., 15 mi. E Eldorado, 7 mi. NE Page field, dry, TD 6,252 ft., Palo Pinto 4,850 ft., Strawn 5,335 ft., Ellenburger 5,966 ft., elev. 2,210 ft.

SOUTHEASTERN NEW MEXICO

HOBBS.—The Texas Co. staked location for a Devonian test as the 1 Ertel, NE NW 27-16s-38e, 2 miles northwest of Amerada Petroleum Corp.'s 1 Hamilton, recent Devonian discovery in 35-16s-38e.

Magnolia Petroleum Co. 1 Markham, SE SE 11-9s-35e, northwest of the Crossroads field, was drilling in lime and shale at 9,487 ft. Operators' top on the Pennsylvanian was 8,877 ft., checking a few feet low to the discovery.

Mid-Continent Petroleum Corp. 1-D U. D. Sawyer, SW NE 27-9s-36e, northeast outpost to the Crossroads field, had total depth at 12,150 ft. and prepared to test. Five-inch casing was set at 12,147 ft. Field reports indicated the well was running 259 ft. low to Mid-Continent 1 Dessie Sawyer. Oil Development Co. 1 Santa Fe-Pacific, 27-9s-36e, was drilling below 12,140 ft. It reported a light show of oil and water from a core at 11,977-983 ft.

Amerada Petroleum Corp. 1-B-TC State.

CARTER CARTER CARTER CARTER CARTER CARTER CARTER CARTER CARTER

Humdinger PUMPS

125,000 GPH down to 3000 GPH

big enough — small enough... for top efficiency on any pumping job you have!

Write for free Catalog on complete Humdinger line.

Mid-West office: 110 N. Main St., Tulsa, or to Main Office: 196 Atlantic St., Hackensack, N. J.

RALPH B. CARTER COMPANY
HACKENSACK, N. J.

SE SW 35-11s-33e. ¾ mile north of the Bagley field discovery, was drilling below 8,354 ft. in lime.

Eight miles northwest of Tatum, Humble Oil & Refining Co. 1-X State, 31-11s-35e, had total depth at 13,228 ft., and was running electrical surveys. Cores from 13,226-228 ft. recovered 1½ ft. of dolomite and chert, in the Devonian. Top on that formation had not been reported.

Amerada 1-BTB State, 26-12s-33e, had total depth at 11,199 ft., in basement rock, and stopped to run electrical surveys. A drill-stem test from 11,090-123 ft., open 4 hours, recovered 2,070 ft. of water blanket, plus 1,535 ft. of slightly gas-cut mud. A second 4-hour test at 11,124-148 ft. recovered water blanket plus 450 ft. of drilling mud and 2,130 ft. of salt water. Flowing pressure was 2,150 psi. Top on the Ellenburger was 11,079 ft., on elevation of 4,259 ft.

In Eddy County, 10 miles southwest of Malaga, Humble 1 Wiggs, 31-24s-27e, ran a 2½-hour drill-stem test of the Wolfcamp at 9,891-10,006 ft. Gas came to the surface in 5 minutes, estimated at 311,000 cu. ft. daily, which decreased to 148,000 cu. ft. daily. Recovery was 400 ft. of gas-cut mud with a light show of distillate. Flowing pressure was 270 psi., and shut-in pressure in 43 minutes was 2,915 psi. Operators drilled to 10,016 ft. in lime and shale, and prepared to core ahead.

SOUTHEAST NEW MEXICO SUCCESSFUL WILDCAT

Lea County: Amerada Petroleum Corp. 1 J. T. Caudle, SE NE 10-12s-33e, 1 mi. SW 1 BTA-State, Pennsylvanian discovery, flowed 285 bbl. 46.8°-gravity oil, plus 7 bbl. water in 24 hr., ½-in. choke, Pennsylvanian top 8,669 ft., perforations 9,028-40 ft., top pay 9,001 ft., TD 11,083 ft., PB 9,045 ft., elev. 4,256 ft.

SOUTHEAST NEW MEXICO WILDCAT FAILURE

Lea County: Bert Fields 1 Baetz, NE SE 13-24s-35e, dry, TD 4,515 ft., base salt 3,790 ft., Brown lime 3,960 ft., Yates 4,040 ft., elev. 3,423 ft.

EASTERN TEXAS

Semiwildcat Completed as Sherman Field Extension

DALLAS.—J. R. & Adam Seitz and A. R. Dillard completed their 1 Glenn D. Woodson, semiwildcat 2½ miles northwest of Sherman in Grayson County, Uriah Burns Survey, A-121, for 112 of oil a day, on the pump, as an extension to Sherman field. The oil was 37° gravity, and the initial gage also had 1 bbl. of water. Pay zone was from 4,858-70 ft., total depth. On a 1-hour drill-stem test of the section, gas came to the surface in 26 minutes, and recovery was 340 ft. of oil, 28 ft. of oil and gas-cut mud, and 2 ft. of salt water. Bottom-hole pressure was 1,950 psi. in 15 minutes.

In northern Smith County, Delta Drilling Co. 1 Haddad, William Price Survey, east offset to the discovery well in Red Springs Rodessa field, had good porosity and odor of oil in the lower Rodessa section of the Glen Rose. Cores from 9,453-9,501 ft., which showed odor and porosity between 9,455-87 ft. A drill-stem test was to be made of the section.

Northwest of the discovery, Humble Oil & Refining Co. 1 Fortson, William Price Survey, reported good odor and stains of oil in cores from 9,746-64 ft. A drill-stem test, open 2 hours and 50 minutes, from 9,700-65 ft. produced a strong blow of gas but had no oil. Gas volume was not estimated.

Five miles northeast of Lindale, Niles Production Co. and J. E. Fleming 1 Crews, Paluxy wildcat, was drilling below 6,229 ft. It reported top of the Comanche shale at 6,100 ft., on an elevation of 378 ft.

In Van Zandt County, operators were nearing contract depth of 6,800 ft. at E. B. Germany & Sons 1 Skinner, Gray Survey, 4 miles southeast of Grand Saline. Plans were to run electrical survey to total depth. Cores at 6,603-12 ft. had hard, silty Paluxy sand, with no shows. Top of the Paluxy was 6,492 ft., which had a light show of gas in the top.

Tide Water Associated Oil Co. and Seaboard Oil Co. 1 Wade, John E. Held Survey, Smackover test on the Keisey salt dome of Upshur County, was drilling lime and shale at 4,120 ft.

In the North Beckville Pettit lime section of the Carthage field, northern Panola County, Earl Hollandsworth 1 Green, J. J. Hooper Survey, was drilling below 6,728 ft. Cores from 6,703-23 ft., in the lower Pettit, recovered 8 ft. of hard lime and shale. Contract depth was 6,850 ft.

EAST TEXAS (DISTRICTS 5, 6 & 6-P) WILDCAT FAILURE

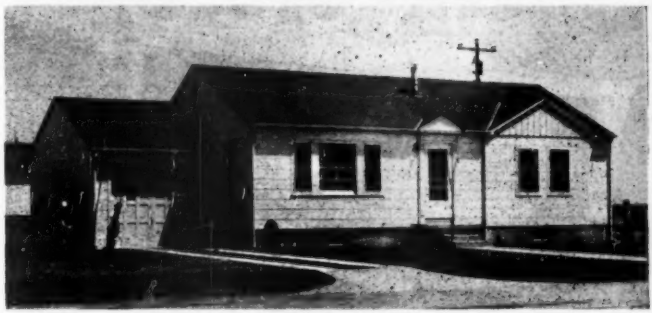
Cherokee County: Lone Star Gas Co. 1 Lillian Pinkston, T. J. Rusk Sur., A-47, 10 mi. NE Jacksonville, dry, TD 4,330 ft., elev. 288 ft.

APPALACHIAN FIELD

West Virginia Well Finds Gas, Continues Drilling

PITTSBURGH. — No important wildcat completions were noted in the past week. In the Steele district of Wood County, West Virginia, Godfrey L. Cabot, Inc.'s 1300 Benjamin Quick, elevation 997 ft.,

STURDYBILT *Homes*
LIKE THIS ONE....



Keep Oil Field Families Happy

PREFABRICATED 30 Years HOME MANUFACTURER

MANUFACTURERS OF SPECIAL MILLWORK; DISTRIBUTORS OF JOHNS-MANVILLE BUILDING MATERIALS; CURTIS WOODWORK

▶ STURDYBILT Prefabricated Houses are modern and smartly designed. They are as conveniently arranged as the best homes in any modern city. That's why oil field families are happier in modern, comfortable STURDYBILT Houses. Before you buy any oil field housing . . . investigate STURDYBILT . . . *first.*

STURDYBILT
SOUTHERN MILL & MANUFACTURING CO.
Tulsa, Oklahoma
Prefabricated, Demountable Houses

phmi
STURDYBILT HOMES COMPLY WITH COMMERCIAL STANDARD CS 22-48 OF THE NATIONAL BUREAU OF STANDARDS FOR PREFABRICATED HOMES

found the Corniferous lime at 4,945 ft., Oriskany sand at 5,053 ft. and struck gas in the top of this formation gaging 100,000 cu. ft., which blew down to 47,000 cu. ft. Drilling is still in progress. In Glade district of Webster County, Hope Natural Gas Co.'s 9227 West Virginia & Pittsburgh Railroad Co., elevation 2,512 ft., which is in a reaming job at this time, reported the top of the Corniferous lime at 7,120 ft., the Chert having previously been reported at 7,134 ft.

Two good shallow sand gas wells were noted. In Sherman district, Calhoun County, Hope Natural Gas Co.'s 9381 Hunter M. Bennett found gas gaging 1,525,000 cu. ft. in the Salt sand, total depth 1,686 ft. In Trap Hill district, Raleigh County, the 9376 Douglas Bowers tested 1,053,000 cu. ft. of gas in the Ravencliff sand, total depth 1,596 ft.

In Georges Township, Fayette County, Pennsylvania, Orville Eberly et al 1 N. E. Murphy commenced drilling, and the well is at a total depth of 120 ft.

New locations reported in Southwest Pennsylvania were five: Red Bank Township, Armstrong County; Buffalo Township, Butler County; Washington Township, Greene County; and Conemaugh and Young townships, Indiana County.

ROCKY MOUNTAIN

More Wildcats Planned in Colorado's Oak Creek Area

DENVER.—Following the discovery of oil by R. E. Havenstrite of Los Angeles in the Oak Creek area, Routt County, Colorado, major operators are reported leasing and planning additional wildcats in the area. The discovery is the first in the past year in Colorado and will apparently lead to considerable development drilling in the area. The well is 2 Ryles, NW SW NE 2-3n-86w, and a 990-ft. northeast offset has been staked by Havenstrite, with others scheduled to be drilled in the field. The well is reported pumping more than 300 bbl. of 38°-gravity oil daily from basal Morrison at 6,747 ft., total depth. Morrison formation was topped at 6,305 ft. The well is approximately 20 miles southwest of Steamboat Springs and is southeast of the Pagoda anticline area where General Petroleum Corp. drilled a Shinarump gas discovery last year.

Atlantic Refining Co. has cemented 7-in. casing at 3,990 ft., through the producing zone, at its 1 State 36, NE NW NW 36-35n-66w, in the Lightning Creek area, Niobrara County, Wyoming, and is preparing to perforate casing and test the well. More than 90 ft. of saturated basal Sundance sand was logged below 3,872 ft. and the well promises to be a good producer. On drill-stem test in the top 10 ft. of sand the well made 700 ft. of 41°-gravity oil in 35 minutes. The block is located southwest of the Lance Creek field, and Atlantic has an extensive spread through the area. The company has drilled four shallow Muddy sand failures on the structure in the past 2 months, with each of the wells having fair but noncommercial shows in that formation.

Ohio Oil Co. has plugged back to 4,429 ft. at its 1 Knievel, NE SE SE 2-15n-49w, in the Gurley area, Cheyenne County, Nebraska, the company's second operation in the area. The well was drilled to 5,026 ft., total depth, and found water with shows of oil in sands below the first Dakota at 4,396 ft. The company is now preparing to test the second well, a 990-ft. offset to the north of the discovery, which was recently completed pumping 225 bbl. of 35°-gravity oil daily. Discovery of oil in the Dakota at this wildcat started an extensive leasing campaign throughout western Nebraska, and the play is still continuing. Ohio is reported to have four blocks in addition to the Gurley area, and plans additional wildcat drilling in the area. Superior Oil Co., Sohio Petroleum Co., British-American Oil Producing Co., Stanolind Oil & Gas Co., and others have reportedly joined in the play.

New locations.—There were 19 new locations, with 9 in Wyoming, 7 in Montana, 2 in Colorado, and 1 in northern New Mexico. In Wyoming Continental Oil Co. is moving in material for 7,000-ft. Madison test at 1 Skelton Unit, NE NW NW 26-45n-100w, Hot Springs County. Tide Water Associated Oil Co. is building roads for a 7,500-ft. wildcat in the Lawn Creek, at 81-22, NE NE NE 22-29n-80w, Natrona County. Amerada Petroleum Corp. has made location for an important test to granite at 1 Unit, Corral Creek, C NE NE 15-4s57e, Carter County, Montana.

Completions.—Thirty-two wells were completed, with 17 in Colorado, 3 in Montana and 1 each in Utah and Nebraska. In Wyoming, California Co. completed its Muddy sand discovery at Borie, Laramie County, with the well flowing 173 bbl. oil in 24 hours through ¼-in. choke. Failures were completed by Union Oil Co. at Moxa, Lincoln County, John Beard at Lightning Creek, and Wilshire and Atlantic at West Fourbear, Park County.

WYOMING SUCCESSFUL WILDCAT

Borie, Laramie County: California Co. 1 Morton-King, CEL NW SW 13-13n-68w, 11,374½ TD, PB 8,570, flowed 173 bbl. oil through ¼-in. choke in 24 hours, Niobrara 7,550, Timpas 7,823, Codell 7,844, Muddy 8,483, Dakota 8,630, Fuson 8,699, Lakota 8,731, Morrison 8,769, Sundance 9,004 Jelm 9,168, Chugwater 9,218, Evaporite zone 9,600, Engleside 10,165, Base Engleside 10 850, Fountain 10,970, Kablinized granite 11,150, granite 11,205.

WYOMING WILDCAT FAILURES

Moxa, Lincoln County: Union Oil Co. et al 1 Govt., C NE NE 30-19n-112w, 12,358

ARCCO
ARCCO ANUBIS
LIQUID GRAVITOMETER
...for PIPELINES, REFINERIES, GASOLINE PLANTS
This ruggedly built instrument of laboratory accuracy is ideal for quick checking and for continuous recording of Specific Gravity of liquids under line pressure. Changes in Specific Gravity of sample are recorded with a very minimum of time lag. Foreign liquids and gases are automatically purged from sample. No moving joints or stuffing boxes to cause friction or leakage. Temperature corrected, this precision instrument is adaptable to high pressures. Hundreds are in daily use in plants and refineries of major companies. Also available as a controlling instrument. Send for bulletin No. 111A.
AMERICAN
RECORDING CHART CO.
3113 E. 11th St. • Los Angeles 23, Calif.
Available for Early Delivery
SEND FOR BULLETIN No. 111-A

TD, plugged and abandoned, Greenhorn 730, Wasatch 1,930, Post-Laramie 3,770, Adaville 5,387, Blair 6,908, Hilliard 7,548, Frontier 11,187, Frontier sand 11,255, Aspen 11,313, Dakota 11,842 (corrected), Sch. tops: Fuson 12,139, Lakota 12,222, Morrison 12,322.

Lightning Creek, Niobrara County: John Beard 1 Mulligan, SE SW SE 12-34n-66w, 1,443 TD, plugged and abandoned, Muddy 1,280, Dakota 1,443, water.

West Fourbear, Park County: Wilshire and Atlantic 1 Fourbear, C NE NE 31-48n-103w, 5,451 TD, plugged and abandoned, Frontier 745, Muddy 1,990, Dakota 2,175, Morrison 2,361, Sundance 2,827, Red Beds 3,325, Dinwoody 4,259, Phosphoria 4,353, Tensleep 4,575, Madison 5,133.

MONTANA WILDCAT FAILURE

Midway area, Pondera County: Peerless 1 De Steffany, NW SW SE 24-28n-2w, 2,180 TD, plugged and abandoned, Moulton 1,678, Sunburst 1,760, Ellis-Madison 2,047.

OHIO, KENTUCKY

Ohio Fuel Gas Brings in Big Litchfield Pool Well

COLUMBUS.—The Ohio Fuel Gas 1 B. C. Wyant, Lot 5, Litchfield Township, Medina County, came in at 8,220,000 cu. ft. to add another large well to West Litchfield pool. Pay was in the top sand at 2,612-2,625 ft. and drilling was stopped at 2,627 ft.

Frank Lyons 4 Harbarger, Lot 42, Parma Township, Cuyahoga County, had small pays in both the red and white Clintons which responded well to shooting, having a shut-in volume of 400,000 cu. ft. Sand was continuous from 3,173-3,254 ft. and gaged 105,000 cu. ft. natural.

Foraker Drilling 1 B. A. Barringer, Sec. 25, York Township, Morgan County, a north offset to the 1 Sipos, had only a small show of oil in the Clinton and was drilled on down to the Medina sand where it made 1,300,000 cu. ft. natural. Clinton was logged at 3,771-3,914 ft. and the Medina at 3,980-85 ft. The same operators finished their 3 Henderson in Section 18, Hopewell Township, Perry County, at an initial production of 33 bbl. The Clinton was logged at 2,817-36 ft. and shot with 60 qt.

New locations continue on the upgrade with 24 this week from 12 counties, Perry having 5, Washington 4, and Tuscarawas 3. Completions totaled 18 with Cambridge having 5 and Mt. Vernon 4.

OHIO WILDCAT FAILURE

Huron County, Greenwich Township: E. A. Fierbaugh et al 1 J. W. Kinsell, Lot 4, no Clinton, TD 2,991 ft.

WESTERN KENTUCKY

OWENSBORO.—I. W. Hartman and Calvert-Willis, Inc., 1 Meredith, S½ E½ 11-P-18, a wildcat on Wabash Island in the Ohio River, 4 miles west of Uniontown, Union County, got a substantial show of gas and recovered 210 ft. of clean oil and 120 ft. of oil-cut mud in a drill-stem test of Cypress sand at 2,305-45 ft. and virtually assures the opening of another new pool, one of several now in the making in this county. Currently, the sand has been passed up in exploratory drilling to lower horizons.

Three miles northeast of Uniontown in the same county, and 2 miles from production, Delta Drilling Co. 1 Walker heirs, NW SE SE 13-P-20, appears to be an unusually good discovery. Producing from the O'Hara lime at 2,512-23 ft., it swabbed initially 200 bbl. in 15 hours before acidizing. After a 4,000-gal acid treatment, it flowed at the rate of 15 bbl. per hour before being shut in for tankage.

I. W. Hartman and associates 1 Culver heirs, 11-P-20, 1½ miles east of the Delta discovery and 1½ miles northwest of production of the Robinson pool, is another pool-opener in the county. In a test of the O'Hara lime at 2,513-21 ft. and 2,527-36 ft., it swabbed 101 bbl. of oil in the first 6 hours, 84 bbl. in the next 24 hours and 59 bbl. in the following 24 hours. Pay previously was acidized with 3,000 gal. Testing of Cypress sand at 2,302-10 ft. is under way. A drill-stem test of this pay before casing was run resulted in a recovery of 240 ft. of oil and 40 ft. of oil-cut mud with an additional 910 ft. of water. Good showings also were obtained in the McClosky, but production tests of this horizon at 2,558-62 ft., 2,585-88 ft. and 2,668-73 ft. proved dry.

Extension of the Glenville pool in Daviess County seems assured by A. Teller, trustee, in his 1 Martin, 13-N-28. In Biehl sand at 1,643-44½ ft., the hole filled 600 ft. of oil in 48 hours. Pumping equipment is being installed for testing. Original objective of the test was the McClosky, expected around 2,000 ft.

EASTERN KENTUCKY

ASHLAND.—The second test in Kentucky to penetrate the deep Cambrian sand section ended in failure as A. H. Carpenter prepared to plug and abandon 1 James Hall, 8-P-67, in western Powell County and on the east flank of the Cincinnati Arch.

One of the most closely watched wildcats of recent years, it had top of Knox dolomite at 7,783 ft. From 5,067 to 6,003 ft. a gray shale section contained four Cambrian sand horizons ranging in thickness from 17 to 87 ft. All were reported to be quartizitic and only one zone showed slight staining and fluorescence. The well was bottomed at 6,088 ft. and now ranks as third deepest hole for the state. First Cambrian sand test was California Co. 1 Spears in Lincoln County drilled in 1946 and some 50 miles southwest of the Hall failure.

In Johnson County, 19-R-79, Ashland Oil & Refining Co. was drilling ahead at 5,642 ft. on 8 Wallace Williams after contractor had spent several weeks in straightening crooked hole.

In southern Menifee County, George McNabb et al have made location for 1 M. E. Strange on Black Stand Branch of Indian Creek. Well will be a Corniferous wildcat test and located some distance north of the Indian Creek pool.

EASTERN KENTUCKY WILDCAT FAILURE

Pulaski County: Hamilton et al 1 Dora Hamm, 15-G-60, dry, TD 1,650 ft., Devonian black shale 420 ft., Ordovician lime 487 ft., no shows.

INDIANA

EVANSVILLE.—Ryan & Sharp are opening another new pool in Vanderburgh County at their 1 George Schweikart, NE NE NW 15-5s-11w, 6 miles northwest of Evansville and about 2 miles southwest of production of the small Darmstadt pool. Producing horizon is the O'Hara lime, from which, in drill-stem test at 2,537-42 ft., 1,922 ft. of clean oil was recovered. Casing was run to the top of the pay, with bottom of the hole at 2,590 ft., plugged back from 2,650 ft.

Gibson County also has another new discovery at Evans & Dobbs and Sam Lewis & Sons 1 Brown, NE NW NE 28-2s-11w, which swabbed 5 bbl. an hour from Benoist sand at 2,112-34 ft. following a 60-qt. shot. Bottom of hole is at 2,150 ft. The location is about 2 miles east of production of the North Owensville pool, and about 3 miles northeast of the town of Owensville.

Charles C. Clark 1 Sugg heirs, SW SE SE 21-6s-14w, which opens a new producing spot between the Welborn and Grafton pools. In Posey County, has been completed as a 10-bbl. pumper from Cypress sand at 2,500-06 ft. after plugging back from 2,516 ft.

A mile north of the Hazelton pool in Knox County, William P. Muller 1-A Maud Simpson, SW NW SW 14-1n-10w, encountered promising oil showings in the Rosiclare at 1,770-75 ft., and has cemented 5½-in. casing at 1,768 ft. for testing. Hole was

PARMACO
PARKERSBURG MACHINE CO. PARKERSBURG, W. VA. U.S.A.
The House of Courteous Service

EXCLUSIVE EXPORT DISTRIBUTOR
PETROLEUM MACHINERY CORP.
30 ROCKEFELLER PLAZA, NEW YORK 20, N. Y.

PARMACO
MEANS
QUALITY
•
ASK YOUR
FAVORITE SUPPLY
HOUSE FOR
PARMACO
PRODUCTS
•

PARKERSBURG
MACHINE
COMPANY
PARKERSBURG, W. VA.

Best Insurance Against Production Line Leaks

RECTORSEAL #1

Rectorseal #1 was designed specifically for the Oil Industry. It is proved beyond any doubt by 11 years of service under all kinds of conditions . . . backed by laboratory tests and field use.

Rectorseal #1 is a positive leak preventer. It's easy and economical to use. A little goes a long way. It makes every connection safe and sure. Applied easily on the threads of every joint of pipe, it will solve your production line leak problems.

Ask your supply store for RECTORSEAL #1 by name.

Write RECTORSEAL, Dept. G, 2215 Commerce St., Houston 2, Texas.

Export: Champion & Smith, Inc., 617 S. Olive St., Los Angeles, Calif.; 10 Rockefeller Plaza, New York, N. Y.

RECTORSEAL
Manufactured by
RECTOR WELL EQUIPMENT CO., INC.
Fort Worth, Texas
MAKING THE OIL INDUSTRY SAFER

drilled to 1,847 ft. and plugged back to 1,776 ft.

INDIANA SUCCESSFUL WILDCATS

Posey County: C. C. Clark 1 Dr. Sugg heirs, SW SE SE 21-6s-14w, IP 5 bbl., Cypress, 2,502-11 ft., TD 2,511 ft.

C. C. Nash 1 Oeth heirs, SE SE NW 7-7s-12w, IP 2 bbl., Mansfield 1,169-82 ft., TD 1,184 ft. (Extension to Stooker pool).

Sullivan County: A. J. Nash 1 R. H. Jackson, NE SW SE 23-7n-9w, IP 5 bbl., McClosky, 1,200-07 ft., TD 1,207 ft. (Discovery well for Paxton pool.)

Frank Strickland 1-A James Kelly, NW NW SE 11-8n-11w, IP 9 bbl., Pennsylvania sand, 590-606 ft., TD 606 ft. (Discovery well for York Ferry pool.)

INDIANA WILDCAT FAILURES

Bartholomew County: C. E. Weddel 1 Gottlieb Lohr, NE NE NE 9-8n-5e, dry, TD 1,110 ft.

Cass County: M. C. Freeman 1 A. R. Kestring, SE SE SE 3-26n-3e, dry, TD 1,019 ft.

Clay County: W. G. Burrage 1 M. Harris, SE NW NE 20-10n-7w, dry, TD 1,878 ft.

Daviess County: Ernest Zink 2 H. Graver, NE NE SE 33-3n-5w, dry, TD 1,045 ft.

Fountain County: Fountain Oil & Gas Co. 1 David Keller, SW NW NE 22-19n-7w, dry, TD 938 ft.

Posey County: Atlas Drilling Co. 1 J. E. Hale, SW SE NE 19-4s-13w, dry, TD 3,014 ft.

Sullivan County: C. Ozier and V. Smith 1 Manon Coal Co., SW NE SW 15-8n-8w, dry, TD 2,125 ft.

Wayne Miller 1 G. Cox, SW SE SW 33-8n-9w, dry, TD 875 ft.

F. L. Runyon 1 L. Ingram, SW SE NW 32-8n-8w, dry, TD 2,389 ft.

MICHIGAN

South Adams Field Gets Good Producer

MOUNT PLEASANT.—Ervin Major completed another big Richfield well in the erratic South Adams field as his 2 Morley, SE SW SW 36-19n-3e, Arenac County, kicked off and flowed at the rate of 65 bbl. of oil an hour after acidization in that horizon at 4,300 ft., total depth. Well was treated with 500 gal. and swab was still in the hole, restricting the flow at least partially. This is the second big Richfield zone producer drilled by Major in the field.

Don Rayburn 1 Cooper-Lucht, SW SW NE 29-17n-4e, Pinconning Township wildcat, Bay County, which has been under test in the Traverse, appeared to be destined for abandonment as an excessive bottom-hole water cut was drowning out the Traverse oil pay. However, Rayburn has spudded a new Dundee horizon wildcat test on the diagonal northeast offset to this exploration and had announced a 4,500-ft. Richfield test well in SW SW SW 20-17n-4e.

The Traverse test well flowed about 127 bbl. of oil and as much, or more, water on initial tests. Hole was plugged back 2 ft. and on last report it had swabbed 3 bbl. of water and 27 bbl. of salt water. This wildcat was originally projected as a Dundee test but a blowout in the Traverse encouraged operators to stop and test in this shallower horizon.

In the new Paris Traverse field, Mecosta County, Carter Oil Co. reported 615 ft. of salt water on drill-stem test at 2,938-45 ft. on the 1 Frederick, SE SE SW 21-16n-10w, diagonal northwest 20-acre offset to the field discovery.

The Oil and Gas Association of Michigan reported that oil production during June totaled 1,308,448 bbl., an increase of 2,441 bbl. over the May production. Accelerated drilling in the Pentwater dual zone oil pool was directly responsible for this increase.

MICHIGAN WILDCAT FAILURES

Allegan County, Casco Township: Norman L. Stevens 1 Wojceichewski-Fearson Comm., NE SE SW 26-1n-16w, Traverse 1,137 ft., dry, TD 1,147 ft.

Heath Township: R. T. Jones 2 U. S. Govt., NW NW NW 23-3n-14w, Traverse 1,561 ft., dry, TD 1,592 ft.

Watson Township: Ralph Perry and R. E. Bradley 1 Sebright, NE NE NE 6-2n-12w, Traverse 1,624 ft., dry, TD 1,632 ft.

Huron County, Huron Township: Elmer McDonald 1 Kinch, SE SE NW 28-18n-14e, Traverse 1,603 ft., dry, TD 1,675 ft.

Mukegon County, Moorland Township: Carter Oil Co. 1 Raison, NE SE SW 9-10n-14w, Monroe 2,508 ft., dry, TD 2,512 ft.

Oceana County, Shelby Township: Roosevelt Oil & Refining Corp. 1 Morningstar, SE SE SE 20-14n-17w, Monroe 2,364 ft., dry, TD 2,432 ft.

Van Buren County, Geneva Township: Louis Zellman 1 Novak, NE SE SW 6-1s-16w, Traverse 1,050 ft., dry, TD 1,074 ft.

ILLINOIS

Gallatin County Wildcat Finds Pennsylvanian Pool

MATTOON.—A new Pennsylvanian sand producing area is being opened about 1½ miles northeast of the North Junction pool in Gallatin County by Oil Management Co. et al 1 Max Wilson, NE NE NW 2-9s-9e. Testing sand at 1,600-14 ft., after a 15-qt. shot, the well swabbed 53 bbl. of oil and 25 bbl. of water in 15 hours. Hole had been drilled to 2,934 ft., but lower formations proved dry.

In the southeastern part of White County, C. E. Brehm 1 Dagley, NE SW NE 2-7s-9e, is another new pool opener. In Cypress sand at 2,555-60 ft., the well swabbed 2 bbl. an hour following a 60-qt. shot., and is being put on the pump for final testing. It is about a mile east of the Herald pool.

National Associated Oil Co. and Continental Oil Co. 1 Cockcroft, NW NW SW 1-12n-11w, which is giving promise of establishing a new producing area in the extreme southeastern part of Edgar County, swabbed 12 bbl. of oil and 20 bbl. of water in 16 hours from McClosky lime, in which casing was perforated at 964-75 ft. and 980-81 ft. Tests followed a 2,000-gal. acid treatment of the pay. In previous tests of the Devonian with casing perforated at 1,949-68 ft., the well got a good showing but failed to produce. Hole had been drilled to 2,093 ft. and 5½-in. casing cemented at 2,091 ft.

A southwest extension of the Omaha pool in Gallatin County, or a new producing area, seemed assured at Carter Oil Co. 1 C. L. Hughes, SE SE NE 8-8s-8e, where testing of Aux Vases sand is under way. Casing was perforated at 2,716-22 ft., and after a 2,000-gal. acid treatment, the well swabbed 25 bbl. of oil and 25 bbl. of water per day. The 7-in. casing is set at 2,780 ft. with hole plugged back to 2,741 ft. from a total depth of 2,936 ft.

About ¼ mile from production in the Allendale area, Wabash County, Hayes Drilling Co. 1 Schafer, SE NW NE 15-1n-12w, recovered 120 ft. of oil and 80 ft. of oil-cut mud in a drill-stem test of Biehl sand at 1,475-95 ft., and looks like it will make a good pumper. Casing has been run to 1,474 ft. with bottom of the hole at 1,495 ft.

Russell P. Johhnson 1 Vest, NE NW SW 16-1n-5e, new pool opener in Wayne County, has been completed pumping 255 bbl. of oil per day. On initial tests the well flowed as high as 65 bbl. per hour. Production is from McClosky lime at 3,000-04 ft., on which casing was cemented at 2,990 ft.

ILLINOIS WILDCAT FAILURES

Christian County: E. N. Landon 1 Schmidt, SW SE SW 10-12n-1w, dry, TD 1,436 ft.

E. H. Kaufman et al 1 Adams, SE SW NE 21-14n-1e, dry, TD 1,271 ft.

Clinton County: W. L. Griffith 1 Goldschmidt, SW SW SE 14-3n-2w, dry, TD 2,412 ft.

Whittmer & Ewing 1 W. L. Ducomb, SW SE SW 10-3n-2w, dry, TD 1,979 ft.

Effingham County: Dale Hopkins 1 Bohrens, SW NW SE 7-7n-6e, dry, TD 2,544 ft.

Gallatin County: Fred Morgan et al., 1 M. Loysdon, SE SW NE 6-9s-10e, dry, TD 2,980 ft.

Macon County: Bridger Basin Oil Co. 1 Fryman, NE NE NW 3-15n-3e, dry, TD 1,385 ft.

Madison County: George Cassens 1 Boos, SE NE SE 9-4n-7w, dry, TD 1,765 ft.

Montgomery County: William Krohn 1 Pange, NE NE NE 19-7n-5w, dry, TD 1,896 ft.

Moultrie County: Brown, Brummitt, and Hausman 1 Rothermel, SW SE SE 32-15n-4e, dy, TD 1,700 ft.

Shelby County: Kuykendall 1 Moberly, NW NE NW 26-12n-5e, dry, TD 2,044 ft.

Wabash County: George Engle 1 McKendree College, NE SW NW 14-1n-13w, dry, TD 2,697 ft.

White County: C. Pollack 1 Bates et al., SE SE SE 16-7s-10e, dry, TD 2,947 ft.

Tuley, Carter, and Duncan 1 Ackerman, NE SE NE 17-7s-10e, dry, TD 3,049 ft.

The Petroleum Situation

(Continued from page 74)

ing fuel for next winter, a job that has been divided between supplier and reseller in the past.

Regardless of the adequacy of reseller margins in the past, whether they have been too high, too low, or just right, part of the costs covered by these margins has been the expense of buying and storing heating oils during the summer months. This year most resellers have failed to perform this function and they can blame only themselves if transportation is not available to move an abnormal volume of distillate when the first cool weather comes.

Refinery output is tied to refinery realization. During the past few months, gasoline production has been consistently above a year ago in spite of reduced crude runs. Yields have been above 45 per cent, but gasoline demand could have been met with the same runs and yields of about 43.5 per cent.

If distillate demands for the winter reach forecast levels, distillate yields must be raised to more than 20 per cent. Refiners can't be expected to increase distillate yields as long as the product is selling for less than the cost of the crude from which it is made. Increased total demand will tend to strengthen the crude market. Refinery runs will be increased but the incentive for increased distillate yields will have to come from a sharp upward revision in distillate prices. If these price increases coincide with spot shortages resulting from transportation troubles, there will be another flood of letters to congressmen.

Residual fuel prices remain abnormally low in comparison with crude

(Continued on page 189)

Deeper Wells Drilled With Fewer Rigs During First 7 Months of 1949

by Polly DeArmond

ANALYSES of figures for the first 7 months of this year indicate that operators are drilling deeper wells with fewer rigs, and more wells per rig. Although there was a decrease of 18 completions (21,672 wells as against 21,690 for the same period of last year), cumulative footage increased 3,388,269 ft., or 4.5 per cent. Wells rigged up and/or drilling at the end of July 1949 totaled 4,586, while at the end of July 1948 there were 4,720 such operations reported.

The net drop in total completions may be attributed to the eastern area (New York, Pennsylvania, and West Virginia), which declined 1,035 wells, or 34.7 per cent, with a proportionate drop of 1,767,051 ft., or 34.1 per cent, in footage. Other decreases in the southern states, Rocky Mountain region, and Pacific Coast were offset by gains in the north and central sections of the country.

The combination of Florida, Alabama, Mississippi, Louisiana, and Arkansas dropped 3.8 per cent in wells, but reported a 6 per cent gain in footage. Completions in Colorado, Utah, Montana, Wyoming, and South Dakota were down 2.4 per cent, and footage fell off 5.1 per cent. California showed a decline of 8.5 per cent in wells, with a 3.3 per cent gain in footage.

In 1949, the Texas area, including New Mexico, noted substantial gains, up 878 wells, or 12.4 per cent and up 3,602,236 ft., or 11.8 per cent. Ohio, Indiana, Kentucky, Illinois, and Michigan increased 261 wells, or 7.4 per cent, and 278,290 ft., or 3.4 per cent. Oklahoma, Kansas, and Nebraska reported 102 more completions, or 2.5 per cent, and an additional 666,969 ft., or 4.8 per cent over 1948.

July vs. June 1949

Comparisons of July with the 1949 completion and footage records of June reflect a drop of 520 wells, or 14.2 per cent, and a decrease of 2,277,404 ft., or 17.2 per cent.

Again the eastern area showed marked declines: down 90 wells, or 32 per cent, and down 137,943 ft., or 26.7 per cent. Texas and New Mexico also dipped sharply in both categories: down 409 completions, or 28.1 per cent, in July, and down 1,976,335 ft., or 32.1 per cent. The Pacific Coast was down 22.6 per cent in wells, and down 25 per cent in footage. The southern states recorded an 8.9 per cent drop in completions, and a 10.1 per cent decline in footage.

Continuing increased activity in the Rocky Mountain region this year accounted for a 16.7 per cent gain in completions over the preceding month. There has also been a steady trend of deep drilling in this area, and July's footage increased one-half again as much as the footage drilled in June. Footage was up 53 per cent.

The north central section reported a gain of 6.7 per cent in wells, and dropped less than 1 per cent in footage. Completions in Oklahoma, Kansas, and Nebraska held steady and footage rose 6.4 per cent.

SUMMARY OF COMPLETIONS, JULY 1949

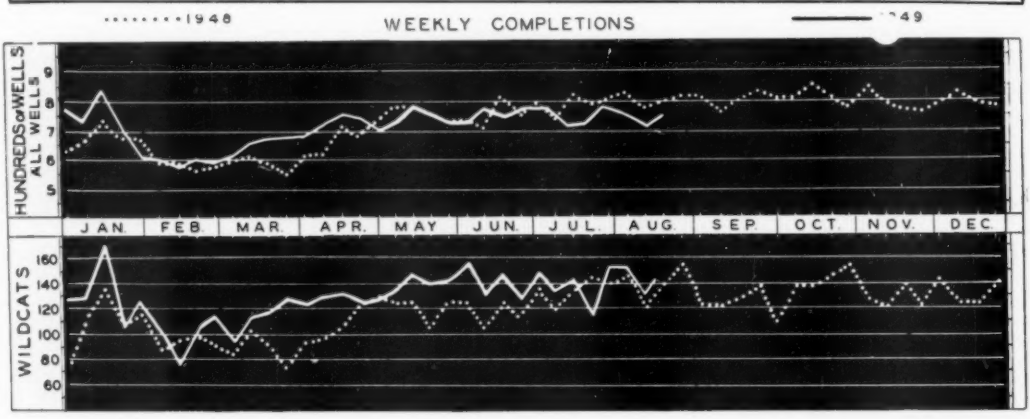
	Total comp.	Oil	Gas	Dry	Under 2,500 ft.	2,500-5,000 ft.	5,000-7,500 ft.	7,500-10,000 ft.	10,000-12,500 ft.	Over 12,500 ft.	Total footage	Rigs and drilling
New York	36	18	0	18	36	0	0	0	0	0	51,934	115
Pennsylvania	119	59	18	42	109	8	0	1	1	0	220,183	237
West Virginia	36	7	26	3	2	13	20	1	0	0	105,334	139
Ohio	84	35	21	28	59	25	0	0	0	0	155,182	143
Indiana	125	44	2	79	101	24	0	0	0	0	223,708	153
Kentucky	80	31	16	33	68	12	0	0	0	0	126,093	75
Illinois	286	156	1	129	129	157	0	0	0	0	662,826	260
Michigan	82	35	2	45	57	25	0	0	0	0	180,170	132
Kansas	317	136	69	112	44	272	1	0	0	0	975,707	410
Neb., Mo., Iowa	2	1	0	1	0	2	0	0	0	0	7,099	14
Oklahoma	368	201	6	161	120	146	84	13	5	0	1,380,639	583
Texas	1,016	642	49	325	315	427	191	69	12	2	4,011,077	1,426
North	200	128	0	72	129	55	16	0	0	0	495,628	165
West Central	160	80	3	77	77	77	6	0	0	0	450,132	297
West	234	199	1	34	41	106	60	18	9	0	1,116,047	408
Panhandle	93	70	18	5	6	86	1	0	0	0	280,187	99
East	41	23	4	14	5	16	15	5	0	0	211,674	109
Gulf Coast	142	76	6	60	15	46	48	31	1	1	803,532	208
Southwest	146	66	17	63	42	41	45	15	3	1	653,877	140
Louisiana	216	125	22	69	113	13	24	25	35	6	1,106,807	234
Northern	140	83	19	38	109	7	14	7	3	0	419,836	78
Southern	76	42	3	31	4	6	10	18	32	6	686,971	156
Arkansas	34	19	0	15	4	23	3	4	0	0	139,307	36
Mississippi	24	11	1	12	1	2	15	2	4	0	161,776	26
Ala., Ga., Fla.	4	0	0	4	0	2	1	1	0	0	20,596	§19
Montana	23	10	5	8	13	8	1	1	0	0	62,133	100
Wyoming	63	31	0	32	8	40	9	3	2	1	389,278	136
Colorado	9	1	0	8	2	5	2	0	0	0	35,914	31
Utah	7	5	0	2	0	6	0	1	0	0	34,792	25
South Dakota	3	0	0	3	1	2	0	0	0	0	9,574	§5
New Mexico	31	20	2	9	5	14	6	4	1	1	155,155	132
California	188	144	2	42	54	63	46	16	9	0	846,837	155
Total July 1949	3,153	†1,731	242	*1,180	1,241	1,289	403	141	69	10	10,962,121	‡4,586
Total June 1949	3,673	2,090	240	1,343	1,390	1,508	470	203	92	10	13,239,525	4,553
Total July 1948	3,794	2,129	292	1,373	1,389	1,601	473	344	87		13,175,002	4,720
Cumulative, 1949	21,672	12,196	1,550	7,926	8,046	8,988	2,801	1,217	544	76	78,134,517	....
Cumulative, 1948	21,690	12,428	1,586	7,676	8,559	8,906	2,523	1,172	528		74,746,248	....

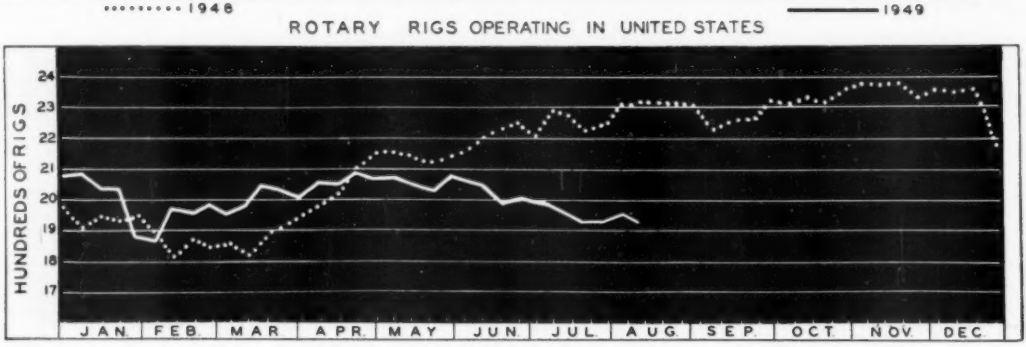
*Incl. 75 service wells: N. Y. 18, Pa. 37, Ohio 2, Mich. 11, Kans. 3, Okla. 2, No. Tex. 2. †Incl. 20 distillate wells: Okla. 3, W. Tex. 2, E. Tex. 2, Tex. Gulf 6, S.W. Tex. 1, No. La. 5, So. La. 1. ‡Incl. wells rigged up and/or drilling at end of month. §Incl. 9 Tenn. ‖Incl. 1 N. Dak.

WEEKLY WELL COMPLETIONS . . . WEEK ENDED AUGUST 20, 1949

	Total of all wells					33 wk.		Wildcat completions and discoveries									
													Cumulative total, 1949				
	Comp.	Oil	Gas	Dry	Footage	1949	1948	Oil	Dist.	Gas	Dry	Total	Oil	Dist.	Gas	Dry	Total
New York	10	5	0	*5	11,493	645	949	0	0	0	0	0	0	0	0	0	0
Pennsylvania	20	6	4	†10	42,074	944	1,624	0	0	0	0	0	0	0	3	1	4
West Virginia	11	0	10	1	26,565	305	496	0	0	0	0	0	1	0	7	7	15
Ohio	18	4	5	‡9	29,283	656	849	0	0	0	1	1	1	0	2	23	26
Indiana	40	14	1	25	65,061	813	643	4	0	0	9	13	23	0	0	150	173
Kentucky	20	6	4	10	36,992	558	426	0	0	0	1	1	17	0	0	44	61
Illinois	58	23	0	35	138,228	1,574	1,424	0	0	0	14	14	38	0	1	267	306
Michigan	19	5	0	§14	34,087	609	499	0	0	0	7	7	20	0	1	187	208
Kansas	75	34	21	¶20	223,205	1,984	1,882	2	0	0	7	9	44	0	5	250	299
Neb., Mo., Iowa	0	0	0	0	0	16	5	0	0	0	0	0	1	0	0	11	12
Oklahoma	91	46	6	‖39	339,491	2,699	2,543	3	0	0	15	18	96	11	10	397	514
Texas	239	154	11	74	995,127	8,366	7,269	6	0	2	39	47	265	33	80	1,438	1,816
North Central (Dist. 7-B & 9)	76	43	2	31	234,359	2,783	2,271	4	0	0	15	19	121	0	11	568	700
West (Dist. 7-C & 8)	63	55	0	8	264,400	2,004	1,970	0	0	0	3	3	36	0	3	164	203
Panhandle (Dist. 10)	17	11	4	2	62,298	633	375	0	0	0	2	2	1	0	0	5	6
Eastern (Dist. 5, 6, & 6-P)	11	9	0	2	59,123	416	337	0	0	0	1	1	7	2	3	87	99
Gulf Coast (Dist. 2 & 3)	45	23	2	20	250,934	1,267	1,156	1	0	1	12	14	55	25	35	251	366
Southwest (Dist. 1 & 4)	27	13	3	‖11	124,013	1,263	1,160	1	0	1	6	8	45	6	28	363	442
Louisiana	57	41	5	11	223,463	1,378	1,372	0	1	0	3	4	37	13	4	131	185
Northern	46	33	5	8	109,042	782	911	0	0	0	2	2	3	2	0	58	63
Southern	11	8	0	3	114,421	596	461	0	1	0	1	2	34	11	4	73	122
Arkansas	6	2	0	4	24,394	197	174	0	0	0	2	2	3	0	0	41	44
Mississippi	7	4	0	3	55,883	215	248	0	0	0	3	3	4	0	1	65	70
Southeastern States	1	0	0	1	11,540	32	32	0	0	0	0	0	1	0	0	27	28
Montana	3	1	0	2	7,052	156	164	0	0	0	1	1	3	0	2	21	26
Wyoming	17	6	1	10	77,606	379	312	1	0	0	3	4	18	0	0	68	86
Colorado-Utah	1	1	0	0	4,235	86	150	0	0	0	0	0	2	0	0	33	35
New Mexico	10	8	0	2	52,030	321	376	1	0	0	1	2	10	0	1	31	42
California	49	30	1	18	211,230	1,658	1,795	0	0	0	15	15	26	0	6	287	319
Total United States	752	390	69	293	2,609,039	23,594	23,232	17	1	2	121	141	610	57	123	3,479	4,269
Total previous week	713	411	50	252	2,370,931	22,842	22,437	37	1	1	92	131	593	56	121	3,358	4,128
Total August 21, 1948	795	444	61	290	2,760,121			23	3	5	109	140	548	50	167	3,061	3,826

Service wells included: *5, †9, ‡2, §4, ¶3, ‖1.





DAILY AVERAGE PRODUCTION FOR WEEK

	Aug. 20 crude oil	B. of M. Aug. demand	Aug. 13 crude oil
Alabama	1,100	1,350	1,250
Arkansas	73,250	88,000	73,250
California	899,800	928,000	858,900
Colorado	65,500	66,000	65,800
Eastern	58,600	60,850	59,000
Florida	1,575	1,400	1,425
Illinois	180,300	176,000	178,900
Indiana	27,200	26,000	26,700
Kansas	265,350	302,000	267,600
Kentucky	22,700	21,000	22,500
Louisiana	483,000	520,000	483,050
North Louisiana	113,700		113,750
South Louisiana	369,300		369,300
Michigan	43,850	46,000	42,800
Mississippi	98,550	109,000	93,550
Montana	26,500	24,000	26,700
Nebraska	500	700	600
New Mexico	125,075	131,000	125,125
Oklahoma	379,400	410,000	376,450
Texas	1,838,200	2,150,000	1,838,200
Dist. 1 (Southwest)	25,740		25,740
Dist. 2 (Southwest)	112,000		112,000
Dist. 4 (Southwest)	177,600		177,600
Dist. 3 (Gulf Coast)	338,860		338,860
Dist. 5 (Eastern)	32,100		32,100
Dist. 6 (Eastern)	79,000		79,000
East Texas field	222,400		222,400
Dist. 7-C (West)	42,300		42,300
Dist. 8 (West)	519,100		519,100
Dist. 7-B (W. Central)	57,600		57,600
Dist. 9 (N. Central)	137,300		137,300
Dist. 10 (Panhandle)	94,200		94,200
Utah	1,200	700	1,050
Wyoming	129,700	130,000	130,000
Total United States	*4,721,350	5,180,000	4,712,850
Change from previous week, up	8,500		
Canada	62,985		57,315
Total U. S. production January 1-August 20		†1,181,333,150 bbl.	
Same period last year (crude plus cond.)		1,276,505,015 bbl.	

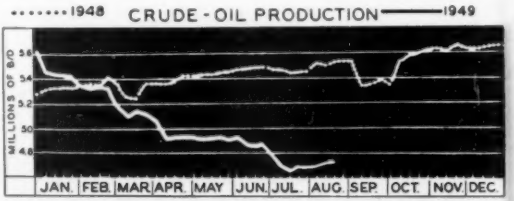
*Not including 80,145 bbl. condensate. †Including 19,174,375 bbl. condensate.

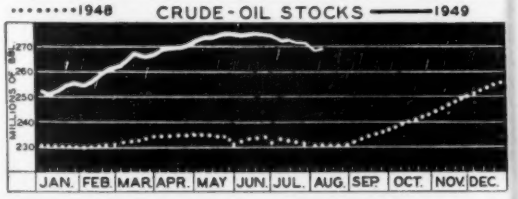
CRUDE-OIL STOCKS BY STATES OF ORIGIN*

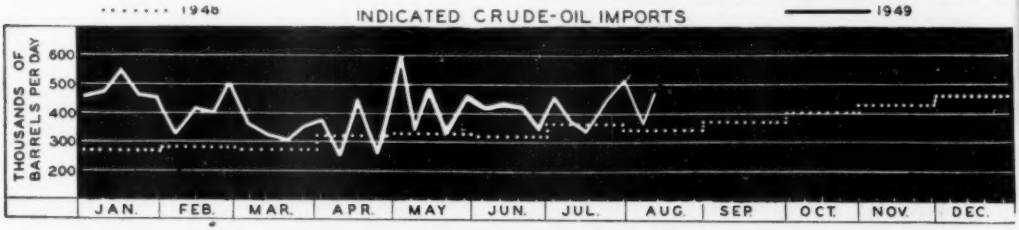
(Thousands of barrels)

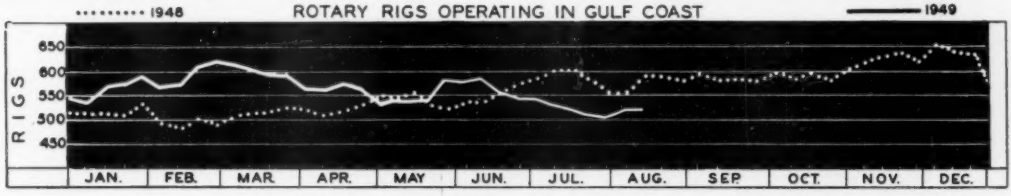
	Aug. 13, 1949	Aug. 6, 1949	Aug. 14, 1948
Pennsylvania Grade	3,318	3,303	2,851
Other Appalachian	2,102	2,225	1,095
Ill., Ind., Mich.	13,993	14,548	10,996
Arkansas	2,945	2,914	2,737
Louisiana	15,614	15,182	11,422
North	3,824	3,671	3,062
Gulf	11,790	11,511	8,360
Mississippi	2,926	3,032	2,815
New Mexico	7,522	7,474	5,972
Oklahoma and Kansas	39,736	39,042	33,718
Texas	122,988	122,465	112,574
East Texas	16,146	16,295	15,457
West Texas	49,638	49,105	42,482
Texas Gulf	28,955	28,895	28,717
Other Texas	28,249	28,170	25,918
Rocky Mountain	14,264	14,110	9,312
California	35,551	35,733	30,493
Foreign	7,771	7,626	5,266
Total United States	268,730	267,714	229,251

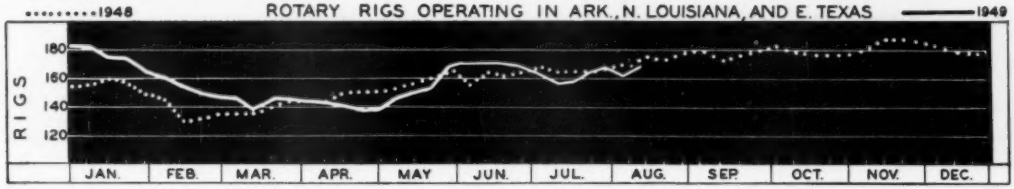
*Bureau of Mines.









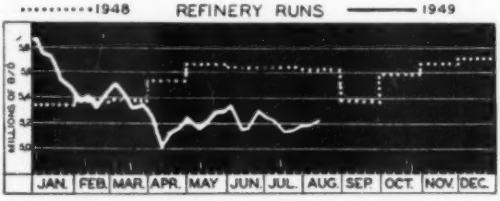


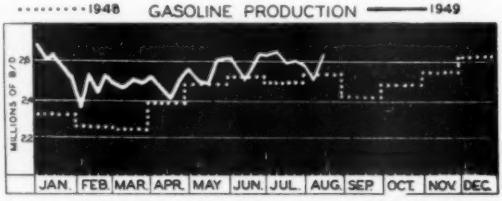
Refining Statistics

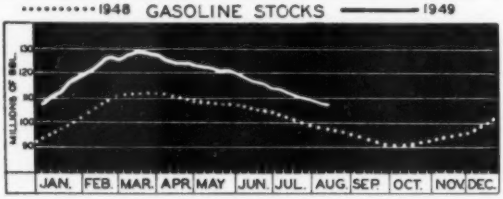
A.P.I. REFINERY REPORT, AUGUST 13
(Thousands of barrels)

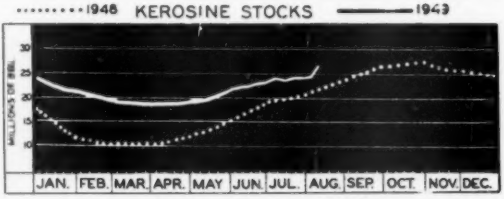
District—	Daily avg. crude runs	Daily average production				Stocks at refineries, bulk terminals, in transit and in pipe lines				Bureau of Mines, August 1948				
		Gasoline*	Kerosine	Distillate	Residual	Gasoline†	Kerosine	Distillate	Residual	Daily avg. crude runs	Daily average production: Gasoline*	Kerosine	Distillate	Residual
East Coast	765	307.1	18.6	140.1	169.7	24,761	10,356	23,141	10,053	868	326.6	41.4	177.9	215.0
Appalachian:														
District 1	71	35.9	3.3	7.1	9.0	2,271	446	686	524	95	42.2	3.7	10.9	9.8
District 2	64	36.0	2.1	4.9	11.6	1,165	145	253	259	28	12.5	1.2	4.7	9.5
Ind., Ill., Ky.	877	485.0	41.7	115.6	130.3	23,265	4,934	11,780	4,871	914	477.9	49.7	139.2	155.2
Okla., Kans., Mo.	419	238.0	26.2	64.0	61.4	9,585	1,720	5,803	2,152	486	245.6	19.3	95.3	76.5
Inland Texas	218	147.0	9.4	16.4	45.9	3,924	748	931	1,452	245	148.2	11.3	26.3	62.1
Texas Gulf Coast	1,269	626.4	53.2	220.1	219.4	15,489	2,916	11,682	7,593	1,412	608.4	96.3	306.5	262.3
La. Gulf Coast	425	224.3	38.4	93.3	42.3	5,370	2,500	4,148	2,007	434	189.5	45.3	100.6	78.8
N. La. and Ark.	78	31.7	5.2	10.6	15.4	2,744	455	961	332	80	30.2	7.5	13.2	17.9
Rocky Mountain:														
New Mexico	12	6.6		1.9	3.0	84	25	94	30	14	7.1	0.5	2.0	4.0
Other Rocky Mtn.	184	75.3	3.4	29.8	29.0	2,533	357	1,685	707	158	70.7	3.8	27.9	34.1
California	865	412.9	—3.9	113.9	303.3	16,983	727	12,651	37,838	887	373.3	16.1	133.9	322.3
August 13, 1949	5,227	2,626.2	197.6	317.7	1,040.3	108,174	25,329	73,815	67,818	5,621	2,532.2	296.1	1,038.4	1,247.5
August 6, 1949	5,188	2,557.0	237.6	894.1	1,031.4	108,444	24,885	72,222	67,281					
August 14, 1948	5,592	2,498.4	292.9	1,062.9	1,187.1	96,634	21,564	57,089	51,368					

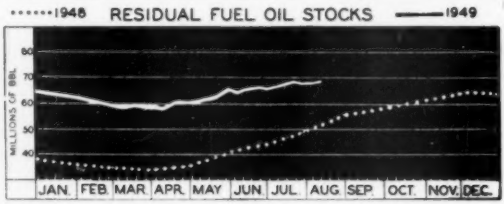
*At refineries including natural blended. †Finished and unfinished.

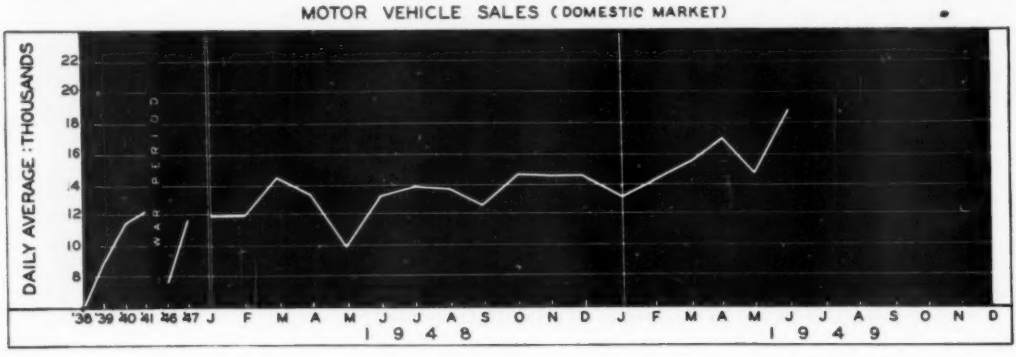











MOTOR VEHICLE SALES (DOMESTIC MARKET)
DAILY AVERAGE: THOUSANDS
WAR PERIOD
'38 '39 '40 '41 '46 '47 J F M A M J J A S O N D J F M A M J J A S O N D
1948
1949

CRUDE PRICES GRAVITY SCHEDULE

Gravity—	Signal Hill, Calif.	Oklahoma, Kansas	Gulf Coast Tex.*	West Tex.†
18-18.9	$1.78			
19-19.9	1.85			
20-20.9	1.93	$2.25		$2.12
21-21.9	2.00	2.27		2.14
22-22.9	2.07	2.29		2.16
23-23.9	2.13	2.31		2.18
24-24.9	2.20	2.33	$2.56	2.20
25-25.9	2.26	2.35	2.58	2.22
26-26.9	2.31	2.37	2.60	2.24
27-27.9	2.37	2.39	2.62	2.26
28-28.9	2.42	2.41	2.64	2.28
29-29.9	2.48	2.43	2.66	2.30
30-30.9	2.54	2.45	2.68	2.32
31-31.9	2.59	2.47	2.70	2.34
32-32.9	2.64	2.49	2.72	2.36
33-33.9		2.51	2.74	2.38
34-34.9		2.53	2.76	2.40
35-35.9		2.55	2.78	2.42
36-36.9		2.57	2.80	2.44
37-37.9		2.59	2.82	2.46
38-38.9		2.61	2.84	2.48
39-39.9		2.63	2.86	2.50
40 and above		2.65	2.88	2.52

*For crude from Daboval, El Campo, and Sand Point.

†Includes Lea County, New Mexico. Last general price change represented a 50-cent increase becoming effective December 6, 1947. Above changes do not include recent reductions of a few buyers applying principally to low-gravity grades.

FLAT CRUDE PRICES

Representative posted schedules per barrel.

East Texas†	$2.65
Kettleman Hills, California*	2.77
Beauregard Parish	2.60
Illinois Basin	2.77
Pecos County, Texas (Yates)	2.35
Bradford, Pennsylvania	3.40
Eastern Ill. and Western Ind.†	2.77
Tomball, Texas Gulf Coast	2.83

*37°-37.9°. †35° and above.

THE recent increase in the price of No. 2 fuel in the Gulf Coast area has been followed by a firming market on the East Coast. Socony-Vacuum Oil Co., Inc., announced increases in New York and New England ranging from 0.3 to 0.7 cent per gallon effective August 17, and Esso Standard Oil Co. raised No. 2 postings throughout its marketing territory August 17. The increases varied from 0.3 to 0.6 cent. Esso's announcement said No. 2 demand has become very strong in the past few weeks and prices in primary markets have advanced sharply. The new price change left unaffected the summer "fillup" incentive of a special ½-cent discount for August deliveries.

In the Mid-Continent area there has been a gradual change in the distillate market over the last few weeks. Since early in the summer most resellers have been out of the market because they expected further reductions in distillate prices. Prices have been reduced and resellers have been warned to fill their tanks as soon as possible. Most of the suppliers now feel that the market has reached bottom and will soon start a sharp upward trend. This has resulted in a reduction in the amount of material offered for sale at current prices.

Refinery production of distillate is still ahead of sales, with the excess moving to primary storage, but many suppliers are refusing to sell at prices that are no higher than the cost of the crude from which the distillate was made. Within the space of a few short weeks the situation has moved from the reseller agreeing to take a few cars, to the place where he may have to contact several spot sellers before he can find one who will release any No. 2 at a price that is near the "low" of the spot market.

REPRESENTATIVE QUOTATIONS

Representative spot-market quotations of leading suppliers as of August 22, 1949. Figures are f.o.b. plant for tank-car shipment in cents per gallon, except for residual fuel oil which shows the price per barrel and wax, in cents per pound.

GASOLINE, KEROSINE, AND FUEL OILS

	Mid-Continent Group 3	New York Harbor (barge)	Tex. Gulf Coast
Regular gasoline, 73-75 octane	9½-10	11-11.5	9½-10
Premium gasoline, 78-80 octane	10½-11	13-13.5	10½-11
42-44 w.w. kerosine	7¾-8¼	7.75-8.4	7⅝-8
No. 2 straw fuel oil	6¾-6¾	6.8-8	6⅜-6¾
No. 6 residual	$0.85-0.90	$1.70	$1.35-$1.45

NATURAL GASOLINE

	Group 3	North Texas	N. La.
Grade 26-70	5½	5	5¼
Grade 18-55	6.6	6	6.3

LUBRICATING OILS
South Texas

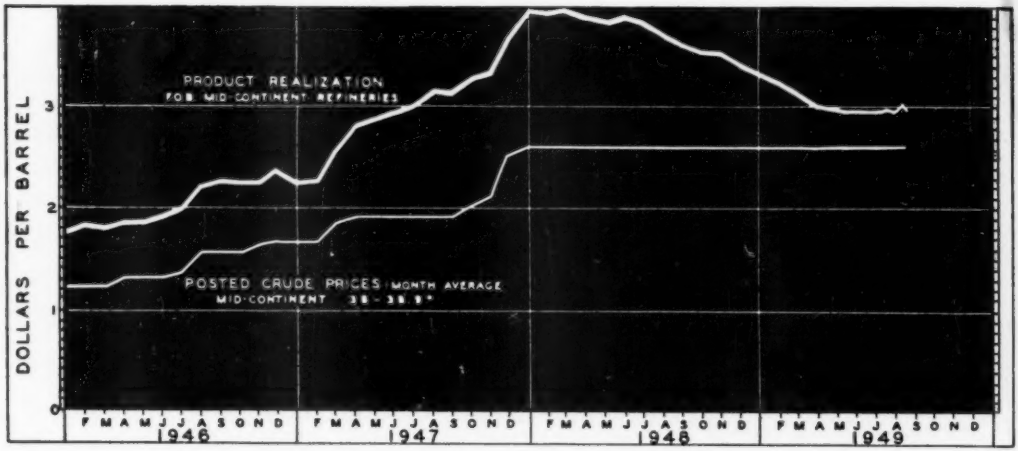
200 vis, No. 2-3 neutral	11
750 vis., No. 3-4 neutral	13-14
2,000 No. 5-6 neutral	15-16

LUBRICATING OILS
Mid-Continent

150-160 vis., D bright stock, 0-10 pp	19
200 vis., No. 3 neutral, 0-10 pp.	13-14
Western Pennsylvania	
144-155 vis., 10 p.t. bright stock	19.5
180 vis., 0 p.t. neutral	20.5

CRUDE-SCALE WAX
Mid-Continent

132-134 A.M.P.	4.5


PRODUCT REALIZATION
F.O.B. MID-CONTINENT REFINERIES
POSTED CRUDE PRICES: MONTH AVERAGE
MID-CONTINENT 38 - 38.9°
DOLLARS PER BARREL
0
1
2
3
F M A M J J A S O N D
1946
F M A M J J A S O N D
1947
F M A M J J A S O N D
1948
F M A M J J A S O N D
1949

In this trend chart refinery realization is based on average Mid-Continent grade crude oil (not 38° gravity only) and average prices for refinery products as published in The Oil and Gas Journal basis Oklahoma (Group 3). Refinery yields confined to gasoline, kerosine, distillate, and fuel oil

EQUIPMENT MEN . . . in the News

Meador Made District Manager by Baker

Baker Oil Tools, Inc., has announced the appointment of J. E. (Jim) Meador as district manager for the Rocky Mountain area, with headquarters at Casper, Wyo.

Meador has been associated with Baker since July 1943 in sales and service work principally in the Los Angeles basin, where he has acquired a wide knowledge of Baker products and their application in well-completion and production operations.

Powers Elevation Opens Branch in Calgary

Powers Elevation Co., Casper, recently opened a branch office in Calgary, which will serve the entire Province of Alberta, Canada. Powers has been determining elevations of oil and gas wells in the Rocky Mountain area for the past year.

The company, owned by Lloyd Powers of Casper, is known in Canada as Powers Elevation Service.

J. J. Simpson of the Casper office has been transferred to Calgary as supervisor of the Canadian operations.

Roush Elected President Of Kerotest Manufacturing

S. J. ROUSH

Edward G. Mueller, board chairman of Kerotest Manufacturing Co., has announced the election of Stanley J. Roush as president and general manager; Walter G. Swaney as vice president and secretary; R. E. Lane as treasurer. New directors are Robert C. Downie and John D. Dupuis.

Waukesha Sales & Service Opens Three New Stores

Three new branch stores to serve eastern New Mexico, North Texas, and western Louisiana have been opened recently by Waukesha Sales & Service Co., Louis M. Pearce, Jr., vice president, has announced.

The new branches are located at Hobbs, N. M.; Wichita Falls, Tex., and Shreveport, La. The Hobbs branch will stock Waukesha engines and parts. Wichita Falls and Shreveport branches will provide complete service facilities in addition to complete stocks of Waukesha engines and parts.

F. A. Chance is branch manager of the Shreveport branch, S. W. Wacey is manager of the Wichita Falls branch, and Tom Gatewood is branch manager for the Hobbs store.

Blaw-Knox Opens Oil and Gas Office at Tulsa

Chemical plants division of Blaw-Knox Co. has announced the expansion of its oil and gas department

C. B. BARRY

C. E. BAIRD

through additional personnel and the opening of a district office at Tulsa. The new office will be under the supervision of R. H. Hazlett, manager of the department, and will provide sales and engineering service to the oil and gas industries of the Southwest.

Charles B. Barry, of Tulsa, has been appointed chief engineer for the oil and gas department and will have his headquarters in the district office. For the past 3 years Barry was employed by Jones & Laughlin Supply Co., as process engineer in the engineering and construction division.

Carl E. Baird has been appointed sales representative for the Tulsa office. Baird's business experience includes 5 years with Pittsburgh Equitable Meter Co., and Merco Nordstrom Valve Co., for which he provided engineering and application service to the gas, refinery, and chemical industries of the Southwest. Late in 1946 he joined the gas equipment department of Blaw-Knox in an engineering and sales capacity.

Inman to Manage East District for Western

C. E. INMAN

C. E. Inman has been named manager of the recently created east district of Western Co., oilwell acidizing and perforating company with general offices in Midland, Tex.

Inman's headquarters are in Colorado City. The first treating and perforating station to be opened by Western in the new district is located at Snyder. W. T. Ivy is manager of that unit. Western's east district will service the West-Central Texas area.

Inman started with the company 5 years ago as a student treater. Before being promoted to his new job he was manager of the company's station in Eunice, N. M.

I.C.I. Extends Wire Line Service to Montana

Robert Harcus, general manager of International Cementers, Inc., has announced that I.C.I.'s wire-line services are now available to operators in Montana through Montana Oil Well Cementers of Cut Bank, Mont.

Harcus also announced the appointment of R. L. "Bob" Gollum as division manager of the Rocky Mountain division. With headquarters in Casper, Wyo., Gollum will supervise all I.C.I. operations in the Rocky Mountain area.

Heywood Made Asst. Chief Engineer of Toledo Plant

H. E. HEYWOOD

H. E. Heywood, Jr., has been appointed assistant chief engineer of the Toledo plant of National Supply Co., according to an announcement by J. R. Mahan, director of engineering for the company. Heywood is a graduate mechanical engineer from Oklahoma A. & M. College. He secured his masters degree in mechanical engineering from California Institute of Technology in 1940.

Lowe Joins Green Fire Brick Executive Staff

William S. Lowe has been elected to fill the position of executive vice president of A. P. Green Fire Brick Co. Lowe comes to the A. P. Green Co. from Reeves-Ely Laboratories, Inc., New York, with which he has been associated since 1944, in connection with which he has served as chairman of board and president, Winsted Hardware Manufacturing Co.; chairman of executive committee, director and treasurer, American Transformer Co.; and vice president, Waring Products Corp.

Gilliam Will Head Brown Pyrometer Supplies Sales

George E. Gilliam will manage pyrometer supplies sales nationally for Brown Instrument division of Minneapolis - Honeywell Regulator Co., it was announced by William H. Steinkamp, Brown field sales manager.

Gilliam has been with the company for 5 years, most recently at its South Bend branch office. He will make his headquarters at the company home office in Philadelphia.

Stanley Joins General Industrial Supply Corp.

C. B. Stanley has been named as oil-country sales engineer by General Industrial Supply Corp. of Fort Worth. Stanley, who is a graduate of Tulsa University, has had several years' experience in selling to the oil industry, particularly pressure vessels. He will make his headquarters in Tulsa.

B.S.&B. Announces Changes In Sales Organization

W. W. Pyeatt has rejoined Black, Sivalls & Bryson, Inc., and will direct the company's New Orleans sales office. Until about a year ago, Pyeatt was connected with B.S.&B.'s engineering department at Oklahoma City before engineering operations were centralized in Kansas City. He has had a lot of experience with B.S.&B. products and is widely known in the oil business.

B.S.&B. announced the addition of Snyder, Tex., to its list of stocking points for field-welded steel storage tanks and oil and gas separators. William A. Watkins, sales and service man of the company's branch at Lafayette, La., has been transferred to Snyder, and will be in charge of sales at that point.

The company has also announced that it will add Mears, Mich., to its list of stocking points for welded steel storage tanks and treaters. This is being done for the accommodation of customers in the nearby Pentwater field. Mears is located approximately 108 miles due west of Mount Pleasant where B.S.&B. maintains a branch sales department.

Ackerman Made Sales Engineer by Ludlow

David D. Ackerman has been engaged by Ludlow Valve Manufacturing Co., Inc., as sales engineer, to work out of its New York office.

Before joining Ludlow, Ackerman was in business for himself as head of Seaboard Well & Pump Co.

Swan Named Paris Agent In Rocky Mountain Area

Henry H. Paris, president of Henry H. Paris Distributor, Inc., of Houston, has announced the appointment of Swan Specialties Co., Casper, Wyo., and Edmonton, Alta., Canada, as distributors for their products in the Rocky Mountain area and Southwest Canada.

Swan Specialists Co. will represent Paris for the sale and distribution of Western safety barrel stand, oil-country tubular products; Harrisburg steel flanges and seamless casing and line pipe couplings; Volcano burners; Oseco fusible plugs and Dresser welding ells.

Western Supply Names Anderson Chief Engineer

E. D. ANDERSON

E. D. Anderson has been appointed chief engineer of Western Supply Co., Tulsa, according to an announcement by J. E. Hughes, manager of Western's heat-exchanger division. Hughes also announced the election of the company to membership in the Tubular Exchanger Manufacturers Association, a group of manufacturers serving the refining, gasoline, and general processing industries.

Anderson came to Western in 1947, after several years in heat-transfer engineering. A graduate chemical engineer of University of Wisconsin, he spent 5 years at Shell Oil Co., Inc.'s, Wood River refinery. This was followed by 3 years in heat-exchanger development and engineering with Brown-Fintube Co.

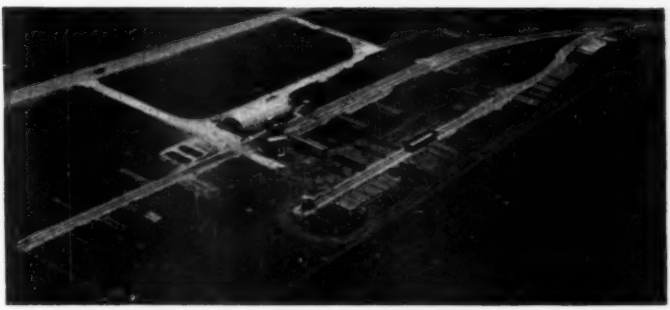
In announcing his company's election in T.E.M.A., Hughes pointed out that the association is responsible for the developments of thermal and chemical standardization of tubular heat transfer equipment.

H. T. Graham Promoted to Assistant Sales Manager

Appointment of Harry T. Graham to the position of assistant general sales manager has been announced by Drew M. Thorpe, vice president in charge of sales, General Refractories Co., Philadelphia.

Graham has been with General Refractories since 1937. Assigned first to the Chicago sales office, he was transferred in 1946 to the home office in Philadelphia. In 1947 he became assistant district sales manager of the Pittsburgh office.

L. B. Foster Co. Opens New Houston Warehouse



L. B. Foster Co., steel concern of Pittsburgh, recently opened this new $150,000 plant at Houston. Main products handled at the plant are pipe, casing, interlocking steel sheet piling, interlocking light-weight corrugated piling, and wire rope

Classified Advertising

The Market Place for the Oil Industry

UNDISPLAYED

All ads, 12 cents a word. Minimum charge, $3.00 per insertion.
Centered Line, any ad, $1.00.
Box Numbers count 9 words when replies are to be sent to our Tulsa Office. Replies forwarded without charge.

DISPLAYED, PER INCH

$12.00 per column inch per insertion. One-point border and 12-point capitals are allowed. Larger type sizes not accepted.

All classified advertising payable in advance.
10% Discount if 3 insertions are ordered at one time.
COPY DEADLINE, 9:00 a.m. Monday prior to each week's issue.

THE OIL AND GAS JOURNAL
P. O. Box 1260, TULSA, OKLAHOMA

EQUIPMENT FOR SALE

FOR CABLE TOOLS
DEGEN PIPE AND SUPPLY CO.
Box 107, Red Fork Station, Tulsa, Oklahoma

FOR SALE at Barnsdall, Oklahoma, warehouse: 1—5" x 16" Goulds Vertical Triplex Single Acting Pump, Fig. 1585, Ser. No. 37835, Gear Ratio 5.06:1, 36 RPM, 5,000 BPD, 800# WP, Price $750.00. Suitable for waterflood project. Cities Service Oil Co., Patridge, Bartlesville, Okla.

FOR SALE: Sullivan 300A drilling rig complete ready to move to job, terms to reliable party. Phone 6508 or 3906, P.O. Box 501, Abilene, Texas.

EQUIPMENT FOR SALE

FOR SALE: Two like new 74,000 bbl. cap. tanks. Low price, at Morgantown, W. Va. 2 new 10,000 bbl. bolted at N.Y. Darien Corp., 60 E. 42nd St., N. Y., N. Y.

FOR SALE: Two Fairbanks-Morse Diesel Engines, 150 H.P. Twin Cylinder, Horizontal Type. Completely overhauled. $1500.00 each. Melton Supply Co., Seminole, Okla.

FOR SALE: Cardwell Rotary Rig, complete with Mast. Suitable for 3,500 ft. drilling. Bargain. Terms. Melton Supply Co., Seminole, Okla.

FOR SALE: 2, complete Wilson Mogul skidtype spudders, with double pole mast costing $3200, powered by 165 hp. GAKU Waukesha motors, good condition, F.O.B. Cars, price $4,000 each, Model 121, Serial No. 3760. One Wilson Mogul Spudder, with mast, less engine, $2,250. 1—145 H.P. Young Drilling engine, complete, At condition guaranteed, gas-gasoline, $2,250.00. 1—Riise 110 H.P. Drilling engine, natural gas, $2,000. 1—Clark 2 cy. 70 H.P. with 6 cy. starting engine, $350. One Caterpillar 60—gasoline-gas engine, with jack shaft and clutch, flat belt drive, $650.00. 25 Pumping engines, South Penn 20 H.P. $125; 20 H.P. Reids and 22½ H.P. Bessemers $150 to $200 each. 100 Pumping and drilling belts for sale. McGinnis, Tri State Oil and Gas Co., Box 827, Parkersburg, W. Va.

NEW 6⅝" O.D. API LINE PIPE

Seventy-three (73) Miles New 6⅝" O.D. 13# API Electric Weld Line Pipe, Plain End, Beveled for Welding, Regular Mill Coating, double random length Van Dyke Protectors Applied. Rock Island Oil & Refining Co., Inc., 335 West Lewis Street, Wichita, Kans. Telephone 7-3325.

EQUIPMENT FOR SALE

NATIONAL "50" Compound Double Drum Rig 126' Cantilever Ideco Mast, 10' substructure, 6,000' 4½" drill pipe, this rig complete and in excellent condition. P.O. Box 205 Sta. B, Bakersfield, California.

CORPORATIONS ATTENTION: This complete aviation dept. must go. Airplane, spare parts, and Pilot. D-17-S Beechcraft, P & W 450 HP. Total time frame 750 hrs. Engine and prop 180 since zero major. Chrome spinner. Beautiful hand rubbed finish, yellow with blue trim. One of the best looking stagger wings in the country. New brakes, battery, and tires. Flares. Flashing lights. 123 gallons gas. Good upholstery trimmed in brown. Complete instruments. Fluorescent lights. Radio, ARC tunable VHF receiver and 5 channel transmitter. Crosley 6 channel localizer and indicator. Bendix 2 channel 3105 transmitter. Bendix MN-28C rotable loop, 150-1500. Marked beacon. Cabin speaker. Spare parts include, BT engine, accessories, prop and spinner. Pickled, 330 hrs. major. Tires and tubes. Butyrate dope. Complete set brakes and seals. 4 chest chutes. Many others. Company Pilot: Age 25, married, 3000 accident free hours, day, night, and instrument. Cubs to B-30. Thoroughly experienced mountains and all phases of cross country. Land dept. when not flying. Best references. For an A-1 company owned airplane, and or pilot, call, wire, write, John A. Lyon, Malco Refineries, Inc., Roswell, New Mexico.

GEOPHYSICAL RIGS for sale, or will furnish rigs and help finance experienced driller starting in contracting business. Write Box D-123, The Oil and Gas Journal, Tulsa, Okla.

COMPLETE used generating plant GM twin diesel with 100 KW generator 3 phase 440 with switch board and voltage regulator. For quick sale. Damon L. Krumsick, Phone Mutual 247, Paola, Kansas.

PIPE LINE PUMPS. Two 3-stage Byron Jackson Centrifugal pumps, direct connected to 400 H.P., 1750 RPM three-phase 60-cycle Westinghouse Motors, unitized on steel base and complete with electric controls. Each pump can deliver between 25,000 and 27,000 barrels crude per day at 350 pounds, or in series between 40,000 and 43,000 barrels at 750 pounds. These units are in good condition. Included are a number of spare parts. Call or write C. G. McLaren, Shell Oil Co., Tulsa, Oklahoma.

FACTORY OVERHAULED—DRILLING OR PIPE LINE ENGINE

Model RX1SV Le Roi 12-cylinder, 6¾" Bore x 7" Stroke, 3006 cu. in. displacement. Complete with Radiator, Starting Engine, Clutch and all latest accessories. Full-size crankshaft. Operated approximately 1,000 hours since complete overhaul and modernizing at factory service shop. Price $4,000.00.

LUCEY PRODUCTS CORPORATION
624 S. Cheyenne TULSA, OKLA. Phone: LD204

FOR SALE
OFFSHORE SEISMOGRAPH FLEET

Bids are invited for the following equipment which includes all boats, Shoran surveying equipment, and radio equipment required for offshore seismic exploration. At present based at Freeport, Texas, and can be inspected by appointment.

BOATS

2—62'-4" Diesel twin screw steel recording boats built to order by Higgins
2—45'-9½" Diesel twin screw "Eureka" boats for Shoran base stations
1—37' gasoline single screw wooden "Eureka" boat
1—43' steel utility barge
1—16' Higgins skiff with outboard motor.

SHORAN EQUIPMENT

Complete Shoran surveying equipment for three mobile stations and three base stations.

RADIO EQUIPMENT

7—Kaar series 46Y radio transmitters (50 watt).
7—Kaar series 25EY radio receivers.
6—Premax antennas.
4—Kaar 642A power supply (110 v AC)
5—Kaar D24Y direction finder receivers.
1—Set Halliburton wire line surveying equipment.
Miscellaneous radio and Shoran test equipment.

ALSO

1—110' converted Sub-chaser Diesel twin screw wooden recording boat complete with necessary radio equipment at present based at Morgan City, Louisiana.

Write Box D-143, THE OIL AND GAS JOURNAL, Tulsa, Okla.

COMBINED VAPOR SEPARATOR & FRACTIONATOR FOR THERMAL REFORMING

One (1) New 5'-6" ID x 61'-0" over-all height Bubble Tower made of 1⅛" Plate and lined throughout with 5/64" and 7/64" thick, 11-13% Chrome stainless steel, type 405. Stainless steel support plates in place for 15 Trays, (Trays not included). Constructed in accordance with the API-ASME Code, stress relieved and radiographed. Designed for 400 PSI @ 750° F. Fabricated by A. O. Smith Corporation. Platform and ladder clips installed.

WOOD RIVER OIL & REFINING CO., INC.
335 West Lewis Street, Wichita, Kansas
Telephone 7-3325

WE CARRY THE LARGEST STOCK OF

New Parts for Civilian & Army Trucks

Winches, Steel Snatch Blocks, Pulleys, Heavy Duty Tools, and Equipment

Phone! Wire! or Write!
RING BROS.
Route 1 Elizabeth, N. J.
Phone: ELizabeth 5-7800

EQUIPMENT FOR SALE

PACKAGED H_2S REMOVAL UNITS

We offer prompt shipment on skid-mounted hydrogen sulfide removal units for treating sour gas for pipe line or fuel gas purposes.

GRAFF ENGINEERING & EQ'PT. CO.
3413 Westminster, Dallas 5, Texas

NEW
FRACTIONATING TOWER
REFLUX DRUM

One (1) New fractionating tower, 5'-0" I.D. X 89'-6" over-all height X 1⅛" plate. Thirty-four (34) bubble trays, ten (10) 18"-300# manways. Stress relieved and built in accordance with API-ASME Code for 350 PSI working pressure.

One (1) new horizontal reflux drum, 5'-0" I.D. x 18'-6" over-all length x 1¼" plate. Stress relieved and built in accordance with API-ASME Code for 350 PSI working pressure.

ROCK ISLAND OIL & REFINING CO., INC.
303 West Lewis St. Wichita, Kansas
Phone 7-3225

PIPE AND CASING BARGAINS

All pipe used lap weld. Tubing not cleaned of paraffin.
All A1 tubing and casing, good collars and threads.

TUBING: 10,000 ft. 2⅜ upset tubing, 4.50 wt. 11½VT. 19c ft.
14,000 ft. 2⅜ regular tubing, 4.50 wt. 11½VT. 20c ft.

USED LAP WELD CASING,
A1, Ready to Run

3200 ft. 5½ O.D. 13 lb. 11½ V.T., 60c ft.
3100 ft. 7 in. O.D. 17 lb., 10 V.T., 60c ft.
1000 ft. 8⅝ O.D. 24 lb. 8 V.T. $1.20 ft.
1000 ft. 10 in. 32.75 wt. 8 V.T. $1.75 ft.
3200 ft. 7 in. O.D. 20 lb. 10 V.T. 80c ft.
(F.O.B. Cars Northern West Va.)

FINEST USED LAP WELD IN WEST VA.
21,000 ft. 5½ in. O.D. A1. 13 lb. casing, 62c ft.
18,000 ft. 7 in. O.D. A1. 20 lb. casing, 82c ft.
2,860 ft. 7 in. O.D. No. 2 grade, 20 lb., 72c ft.
(F.O.B. Cars near Charleston, W. Va.)

BARGAINS IN LINE PIPE

75,000 ft. 2⅜ 3.75 wt. used line pipe, threaded and shopped, ready to run, F.O.B. cars, Friendship, N. Y., 15c ft.
60,000 ft. 2⅜, 3.75 wt. some used 4 lb. tubing not shopped, 1/3 A1 pipe, 1/3 second grade, 1/3 3rd grade pipe, 7½c ft. Ship from Oil City, Pa.

DRIVE PIPE: 2,500 ft.—8⅝, 29 and 32 lb., reconditioned drive pipe, heavy collars, good tapered threads, ready to run, $1.58 ft. (from Oil City, Pa.).
Line Pipe: 7,000 ft., A1, used once, 1 in. heavy seamless tubing, long collars, 14c ft.
14,000 ft. 2⅜, 3.75 wt., used, reconditioned line pipe, ready to run, 14c ft.
CASING: 3,000 ft. 6¼, 13 lb. lap weld, 11½ V.T. used casing, ready to run, 65c ft. 2,000 ft. 4½ casing, 65c ft.

SEND US YOUR PIPE ORDERS AND INQUIRIES

12,000 ft. 5 in. O.D. used wrought iron line pipe, T&C 8 thread, 45c ft. Will plain end and bevel at cost of extra work.
4,500 ft. 4 in. O.D. T and C. good straight pipe, ½ of it shopped, 42c ft. (Ship from Oil City, Pa.).

RIGS—ENGINES—BELTS—TANKS
CABLE TOOLS

Spudders, Drilling Engines, Regulators, Sucker Rods, Bits, Bailers, Wire Lines.
Phone or call on H. P. McGinnis.

TRI STATE OIL AND GAS CO.
Box 827, Phone 7-5121 or 7-5888
for Appointment.
Parkersburg, West Va.

EQUIPMENT FOR SALE

FOR SALE: Complete outfit for water well drilling, in good condition, including: Rotary Mayhew 1000' drill, tank truck, supply truck, and house trailer. Also available for sale supply of pipe, pumps, etc. For details write to Buell-Edlund Drilling Co., Box 154, Miles City, Montana.

Several Army Surplus 4½" x 6" Gaso Duplex 1860 Pumps—two piece skid mounted with Chrysler 8 cylinder engines. Will sell pumps only or complete units about half price.

R. H. COFFIELD
ATTN: W. H. Orr
Phones: 132—Rockdale, Texas
A-66064—Houston, Texas

EQUIPMENT FOR SALE

FOR SALE: McKissick Tubing and Floor Blocks. Save 50%. Melton Supply Co., Seminole, Okla.

TANK HEATERS
Thermetal Co., Sales Engineers
4529 Gillham, K. C. (4), Mo.

FOR SALE

13—230 H.P. Type 10 Bessemer New 17" Power Cylinders complete ready to run with 16" to 18" Compressors. 1—230 H.P. Clark Horizontal with Compressors. Located Salem, Illinois.

ENGLE PETROLEUM, Incorporated
Box 655, Evansville, Indiana

ALMOST NEW—DRILLING OR PIPE LINE ENGINE

Model RX1SV Le Roi 12-cylinder, 6¾" Bore x 7" Stroke, 3006 cu. in. displacement. Complete with Radiator, Starting Engine, Clutch and all latest accessories. Operated approximately 1,000 hours. Price $6,500.00.

LUCEY PRODUCTS CORPORATION
624 S. Cheyenne TULSA, OKLA. Phone: LD204

FOR SALE

Shot Hole Rig **Water Well Rig** **Core Rig**

National Type 1-D Drill; Hollow Kelly; Chain Pull Down; Mast 25' 6"; With Gardner-Denver Model FXF Pump, Size 4½ x 5; Above mounted on 1946 Dodge WHA 46, 16,000# GVW, 2 Ton, 148" WB; Sale Price $3,500.00

National Type 1-D Drill; Hollow Kelly; Chain Pull Down; Mast 25' 6"; With Gardner-Denver Model FXF Pump, Size 4½ x 5; Above Mounted on 1942 Chevrolet Truck 1½ Ton, 160" WB; Sale Price $2,500.00

THE ATLANTIC REFINING COMPANY
P. O. Box 2819
Dallas 1, Texas

NOW IN PROGRESS
OUR LATEST LIQUIDATION

100 OCTANE GASOLINE REFINERY
LOCATED AT COTTON VALLEY, LA.

EQUIPMENT IN UNUSUALLY FINE CONDITION

ADDRESS INQUIRIES TO:
P. O. BOX 1787
SHREVEPORT, LA.
TELEPHONE: COTTON VALLEY 26

DULIEN STEEL PRODUCTS, INC.
of Washington
9265 E. MARGINAL WAY
LANDER 6000
SEATTLE 8, WASH.

EQUIPMENT FOR SALE

BULLDOZERS: 1 D6 Caterpillar new $9,000. 1 D6 Caterpillar less than year old $7,000. 1 TD14 International less than year old $6,500. 1 TD14 International recently overhauled $3,750. 1 TD9 International recently overhauled $2,750. Motor graders: #8 American recently overhauled $2,500. #51 Adams recently overhauled $3,000. 1 60 C.F.M. Chicago Pneumatic compressor with hammer, hose and bits, used very little, $1,000. Western Construction Co., Phone 3241 or 5571, San Angelo, Texas.

FOR SALE: CARDWELL Model R double drum draw works manufactured 1946, in good condition, price $9,000.00. Box D-155, The Oil and Gas Journal, Tulsa, Oklahoma.

3100 4⅞" casing 10 lb. 3000' 6¼" casing 13 lb., ready to run; both sizes 65c. M. J. Regan, Coffeyville, Kans.

FOR SALE: New Beaird Packaged Compressor Plant with Ingersoll-Rand Type CXVG 225 HP two stage gas compressor equipped with hand operated fixed volume pockets. Intake pressure range 100-200 PSI. Discharge pressure 1000 PSI. Capacity range 1,450 to 2,050 MCF. Ready to operate. Location Bishop, Texas. Box D-161, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE: Failing "1500" portable rig for shot-hole, core, water-well, and shallow production drilling. Equipped with sand reel and bailer. Mounted on GMC truck. Rig and Truck in excellent condition. Rider & Montgomery, Box 523, Douglas, Wyoming.

FOR SALE: Two 6 cylinder Hydraulic Casing Pulling Machines. Box D-158, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE: 1945 Sullivan #200 mounted on White truck. Contact James H. Green & Co., day phone 9884, P. O. Box 1465, San Angelo Texas.

USED Franks Well Servicing Unit, super East Texas model, 7 x 8 x 62-foot pole mast, good condition. Box D-165, The Oil and Gas Journal, Tulsa, Oklahoma.

O E M INDUSTRIES
Manufacturers
INDUSTRIAL GEARS & SPROCKETS. MACHINE PARTS OR COMPLETE ASSEMBLIES.
WE **Know How** TO PUT **Your Ideas** INTO PRODUCTION
PHONE M-4931
301 N. JUSTIN ST., DALLAS 11, TEXAS

FOR SALE—$17,500.00
COMPLETE MASTPOLE ROTARY RIG
Capable of 3,000 foot drilling.
Call Johnson 2-8323 or wire or write
612 Staley Bldg., Wichita Falls, Tex.

FOR SALE OR TRADE
NEW SEAMLESS STEEL TUBING
Plain End Single Random Lengths

50,000 feet	2¼"	O.D. X .140"	Wall
100,000 feet	2"	O.D. X .140"	Wall
100,000 feet	3¼"	O.D. X .160"	Wall
75,000 feet	5⅜"	O.D. X .200"	Wall
25,000 feet	5⅜"	O.D. X .180"	Wall

The above are excellent substitutes for standard pipe sizes and have approximately the same flow as 2", 3" and 5" standard pipe. All the above tubing is guaranteed for 1200# working pressure. We will exchange all or any part for an interest in good oil deals or will sell outright to financially responsible parties on long-term payment basis.

Address Box D-156
THE OIL AND GAS JOURNAL
Tulsa, Oklahoma

EQUIPMENT FOR SALE

FOR SALE: Wilson-Snyder 12PLD pump, mud boat mounted, 48" 9 belt C section sheave, bargain, P. O. Box 324, Dallas, Texas.

FOR SALE: One Hydraulic Casing Pulling Unit, Skid-Mounted, with or without mechanical breakout, Three, Five and Seven inch Ram Jacks. W. F. and M. Company, Box 1253, Seminole, Okla. Phone 1885 or 925 Seminole.

REFINERY AND GASOLINE PLANT EQUIPMENT

(1) Vacuum tower, 5 ft. x 44 ft. 7 in. x ⅜ in., with 13 trays and pipe coil in bottom. $2500.
(1) Gasoline weathering tower, 3 ft. 6 in. x 50 ft. x ½ in., with four trays on 16 in. spacing; 200 lb. test with 2 ft. 4 in. x 10 ft. condenser on top. $1100.
(1) Pressure vessel—9 ft. 2⅞ in. x 41 ft. 3½ in. x 1 7/16 in. thick, double riveted construction. $5000.
(1) Still, 6 ft. x 35 ft. x 1 in., dished heads, 200 lb. W.P. with 200 sq. ft. 2 in. pipe coil. $2500.
(6) 18,000 gallon casinghead gasoline storage tanks, 10 ft. x 30 ft. x ½ in., dished heads. $900 ea.
(5) 8,000 gallon casinghead gasoline storage tanks, 7 ft. x 30 ft. x 7/16 in., dished heads. $600 ea.
(5) Vessels, 3 ft. 6 in. x 10 ft. x ⅜ in., dished heads. $190 ea.
(1) Truscon Steel Building, 60 ft. x 186 ft., heavy fabricated structural steel and steel panel construction. With steel sash and door. $5580.

Above listings subject to prior sale.

Write—Wire—Phone

BROWN-STRAUSS Corporation
P. O. Box 78 Phone LD 169
Kansas City, Missouri

EQUIPMENT WANTED

PIPE, Valves and Propane tank wanted: 3" and 4" pipe car load lots, no objection to internal corrosion and pitting, also Propane tank, also unloading compressor, also high pressure valves and cocks up to 3". Aylmer Trading Co., Aylmer, Ontario.

WANTED: One 250-hp., 3-stage, 500-psia. power and compressor unit. One 300-hp., 4-stage, 1,000-psia. power and compressor unit. Replying, give make, location, condition, power fuel, price. Box D-150, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED — One Gentry-Mitchell Boring Machine. Must be in good condition. Write Box 311, Bound Brook, New Jersey.

WANTED: One 300 or 400 HP Gas Engine Compressor Unit. Box D-163, The Oil and Gas Journal, Tulsa, Okla.

HELP WANTED

MECHANICAL ENGINEER

Thorough university background followed by five or more years of outstanding achievement a definite requirement. Must have creative ability, a precision-technical mind. Men of less ability should not make inquiry. Salary commensurate with rigid requirements. A Missouri corporation. Correspondence confidential. Box D-160, The Oil & Gas Journal, Tulsa, Oklahoma.

WANTED

Independent Geologist who wants to locate in Rocky Mountain area. We will furnish office phones, stenographer, etc. in Denver free for a conservative amount of consultation.

Box D-157, The Oil and Gas Journal
Tulsa, Oklahoma

GEOPHYSICIST
CARACAS, VENEZUELA

Senior man familiar with interpretation of seismic and gravity data, capable of independent review work. Minimum 5 years experience. Liberal living allowances and end of year bonus provided. Write complete details of experience and background, stating salary requirements to Foreign Personnel, The Atlantic Refining Company, Box 2819, Dallas, Texas.

HELP WANTED

CHEMICAL Engineer as assistant superintendent in combination natural gasoline and LPG plant. Opportunities for advancement. Give experience. Box D-1430, The Oil and Gas Journal, Tulsa, Oklahoma.

GEOLOGIST with current or recent active experience in West Texas wanted for geological department of independent oil company located in Midland, Texas. Excellent opportunity for man under forty years age who can organize, direct and administer all phases of an aggressive geological program leading to the development of production. Personal interview may be arranged based on merit indicated by a written outline of past experience and training. All replies will be handled in confidence, and should include date of availability and starting salary desired. Recent photo or snapshot would be helpful. Address Box D-139, The Oil and Gas Journal, Tulsa, Oklahoma.

GEOPHYSICIST

A well established, major geophysical company wishes to employ a highly qualified party chief. The individual must have a college degree, a minimum of 2 years actual experience as a party chief, and be willing to move with the seismic party. This is a solicitation for a man of outstanding caliber who has the capacity to advance in a company with a high regard for its present good reputation. Give age, education, experience, salary expected, references, and all other appropriate details in first reply. Our employees know of this ad. All replies will be treated confidentially. Reply to Box D-144, The Oil and Gas Journal, Tulsa, Oklahoma.

HOUSTON DISTRICT Sales Engineer: Engineer familiar with pumps, compressors, exchangers, etc., having sold this type of equipment in Texas for at least the last 3 years to refinery, gasoline plant, and pipe-line companies. Replies confidential. Box D-117, The Oil and Gas Journal, Tulsa, Oklahoma.

RESIDENT ENGINEER, refinery or gasoline plant construction. Immediate employment. Box D-133, The Oil and Gas Journal, Tulsa, Oklahoma.

NEW foreign and domestic Oil Employment Directory. Over 500 listings in drilling, production, refining, natural gasoline, pipe lines, geological, exploration, supplies, manufacturers, services; and trucking, refinery and pipe line contractors, showing where to apply for jobs. Price $5.00. Oil Industry Mailing List, Box 2603, Tulsa, Okla. (Our 28th year).

WANTED: Oil treating engineer, headquarters Oklahoma City, to establish company-wide treating methods, 12 states. Includes instruction of company personnel. Must have at least three years oil production treating experience. State full particulars Address Personnel Department, Sohio Petroleum Company, First National Building, Oklahoma City, Oklahoma.

CORROSION MAN

Must have broad thorough technical education, not less than five years of successful experience. Requirements stiff. Salary in keeping with ability. Box D-159, The Oil and Gas Journal, Tulsa, Oklahoma.

CONSTRUCTION MEN

Welders, Ditch and other inspectors. Salary and flat expense allowance. Box D-137, The Oil and Gas Journal, Tulsa, Okla.

WANTED: 2 young men, 24 to 27 years of age.

1 Graduate Geologist.
1 Graduate Petroleum Engineer.

Steady work in Michigan with small Independent producer. Write: Norman L. Stevens, Breedsville Road, Bangor, Michigan.

WANTED: Associate Professor of Petroleum Engineering — part-time research. Graduate work and industrial experience required. Reply Box D-145, The Oil and Gas Journal, Tulsa, Oklahoma.

SITUATIONS WANTED

LADY with extensive oil and legal experience, secretarial and office management, desires work with independent oil company. P.O. Box 2273, Casper, Wyoming.

SALES Manager, petroleum district or national scale; hundreds of contacts latter basis. Have built, operated and sold to refineries. Working knowledge of drilling and production. Highest references present connection. Box D-164, The Oil and Gas Journal, Tulsa, Oklahoma.

SITUATIONS WANTED

INDEPENDENT oil operator desires connection as land man; close deals. Age 38. Experienced all phases oil industry. Available about 30 days; anywhere. Box D-131, The Oil and Gas Journal, Tulsa, Oklahoma.

ENGINEER-SUPERINTENDENT — M.S. in Ch.E., age 35, registered Texas engineer, thorough knowledge refining, nine years varied experience engineering and plant supervision, most recently manager small refinery, available at once due to plant shut down. Write WRS, Box 112, Winnsboro, Texas.

EXPERIENCED GRADUATE MECHANICAL ENGINEER wants connection which may require any of the following qualifications: Oil field equipment sales—Experience in leasing, drilling and producing oil wells—10 years field and executive experience with nationally known service companies. Box D-142, The Oil and Gas Journal, Tulsa, Oklahoma.

PETROLEUM engineer, 33, married, B.S., 7 yrs. experience. Qualified to supervise drilling, production, or reservoir work. Box D-149, The Oil and Gas Journal, Tulsa, Oklahoma.

ACCOUNTING Graduate—Bachelor's degree; expect to qualify for Master's January, 1950. Available, mid-September; age 29, married. Rodney Moore, 302 South Madison Street, Bloomington, Indiana.

INDUSTRIAL TRAINER

Fifteen years industrial training with major oil companies — sales, manufacturing and production. AB and MS Degrees. For personnel director or training director. Box D-154, The Oil and Gas Journal, Tulsa, Oklahoma.

EXECUTIVE Engineer with fourteen years general Petro-Chemical experience desires change to smaller company or consulting firm. Specialist in processes for recovery and use of refinery by-product gases. Only position with responsible charge of design or development work considered. Box D-162, The Oil and Gas Journal, Tulsa, Oklahoma.

ROYALTIES

DEEDED ROYALTIES
San Juan Basin & Permian Basin. Write Harry S. Wright, Wright Bldg., Farmington, New Mexico.

ROYALTIES IN HOT AREAS!
Recent strikes have focused attention on Montana's deeper oil zones and major companies are moving fast, drilling and leasing. We buy direct in the field, sell direct to our customers. Write LANDOWNERS ROYALTIES COMPANY, Box 1225, Great Falls, Montana.

CASH MARKET for PRODUCING ROYALTIES
ROBERT L. KINKAID
World Bldg. Tulsa, Oklahoma

BUSINESS OPPORTUNITIES

$40,000.00 to invest in enterprise which will make full use of my ability. Graduate engineer, wide experience foundations, pipe lines and executive. Box D-135, The Oil and Gas Journal, Tulsa, Oklahoma.

WE WILL FURNISH brand new seamless casing, tubing and line pipe, in exchange for interest in good oil production. Give us details of your production.

VALLEY STEEL PRODUCTS CO.
124 Sidney Street, St. Louis 4, Mo.

LEGAL BLANKS

BURKHART LEGAL BLANKS since 1908 Oil-Gas (all states). Business, Real Estate, Legal Forms, Leases, Revised With Government Regulations, Commercial Printing, Catalog and Samples on request. Burkhart Printing & Stationery Company, 115 South Cincinnati, Tulsa 3, Oklahoma.

PATENT ATTORNEYS

PATENT Practice before U. S. Patent Office. Validity and Infringement Investigations and Opinions. Booklet and form "Evidence of Conception" forwarded upon request. Lancaster, Allwine & Rommell, Registered Patent Attorneys. Suite 418, 815-15th Street, N.W., Washington 5, D. C.

LEASE AND DRILLING BLOCKS

OIL and Gas lease; 60 acres lots 2 & 3, 17-35 17 E. Montgomery Co., Kans. Wilcox 1200's One well part time pumping making approximately 5 bbls. Full time pumping should make 8 to 12. 2 Ideal locations should bring production to 50 bbls. Price $3500. M. J. Regan, Coffeyville, Kans.

FOR SALE: Oil and Gas Leases and drilling propositions in shallow territory of Allen, Simpson, and Warren Counties, Kentucky. W. P. Harley, Bowling Green, Ky.

OIL & GAS lease 260 acres 6-35-13E Chautauqua County, Kans., 4 wells, 7 bbls. 900° $10,000. M. J. Regan, Coffeyville, Kans.

WILL BUY oil leases anywhere, large or small blocks if any likelihood of oil field or good geology, provided you co-operate in furnishing all necessary information. Write fully what you have. Box 2153, Denver, Colo.

WHY gamble money drilling in search of oil? Buy ½ or all my production. 18 shallow wells, Penna. Grade, Southern Ohio. Look it over and make me an offer. Inquiries answered. F. M. Kissling, Hemlock Grove, Ohio.

OIL and Gas Lease: 80 acres, South ½ of Northeast quarter, 10-34-14, Montgomery County, Kansas. Wayside Sand, 610 ft., flood development on three sides. For particulars: M. J. Regan, Coffeyville, Kansas.

HAVE 2,800-acre block with one small well. Ellenburger production at 3,400 ft. New Pumping Unit, Tanks, Tubing, and Rods. Located in Comanche and Erath Counties, Texas. Contact C. O. Taylor, 1110 10th St., Lubbock, Texas.

WANTED to buy settled production sand wells. Preferably Illinois, Indiana, Kentucky. Will consider 40 or 50 barrels a day in Oklahoma, Kansas, or Texas. Gardnhire Brothers, Inc., Box 351, Bartow, Florida.

OIL & GAS lease 240 acres S½ of SW¼ sec. 21 and NW¼ of sec. 28 T-29-14, Washington County, Oklahoma. 3 wells. 8 bbls. 1200° $12,000. M. J. Regan, Coffeyville, Kans.

NEW MEXICO OIL FIELDS

OPERATORS, LEASE & ROYALTY BUYERS. Royalty close to production in famous Cross Road Field, also Leases & Royalty on Important potential Oil Structure. Maps & Data on request.

W. J. PETERMAN, Geologist
Portales, New Mexico

LEASES ROYALTIES

PRODUCING OR NONPRODUCING

Texas, New Mexico, Oklahoma, Louisiana and Illinois

Inquiries Invited

B. D. BUCKLEY

60 Broadway Drive, Clayton (5), St. Louis, Missouri

NORTH DAKOTA MINERALS

Bought direct for you on purchase order. I am thoroughly familiar with this play. Wire, call or write

JOHN ALLEN
806 Clarence Parker Hotel
Minot, North Dakota

(Member National Oil Scouts and Landmen Association. References exchanged.)

FOR SALE

TIMBERLAND FOR SALE

12,000 acres; pine and hardwood region, North Arkansas; fee simple title; surface and mineral rights. Good growing timberland for investment. Price $55,000. Will pay out in 5 years. Management service available. Southwestern Forests Associates, 518 North Cedar Street, Little Rock, Arkansas.

The Petroleum Situation

(Continued from page 177)

prices and since they must compete with coal in the high-demand areas, there is little chance of returning to the price levels that existed early in 1948.

High yields of gasoline, if continued through the next few months, will result in such high inventories at the beginning of cold weather that refiners may have storage problems before demand increases in the spring. Unusually high gasoline stocks near the end of winter could disrupt the gasoline market.

Natural gasoline prices are low when compared with motor fuel prices and stocks remain high. Light hydrocarbon sales are above last year but income from those sales is down.

Lubricating oil demand was down about 12 per cent in the first 5 months of the year, and while sales are expected to increase during the last half, total deliveries for the year will be under 1948. The 1948 demand represented a decrease over 1947 mostly because of the decline in exports.

Current trends do not give any indication of an immediate cut in imports, now running about 600,000 bbl. daily. Calculated crude imports for the 5-week period ended August 13 averaged about 425,000 bbl. daily. Some do not consider imports as a minus entry in the petroleum ledger. State Department officials, in an analysis of the import situation, expressed doubt that imports are a serious threat to domestic producers. On the other hand, the producers themselves feel that decreased allowables are a direct result of increased imports.

Brochure on Offshore Operations Distributed

HOUSTON.—Offshore drilling operations in the Gulf of Mexico are comprehensively covered in a brochure distributed this week by Lanham, Langston & Burnett, Houston insurance counselors, to leading oil people throughout the country.

The brochure consists of reprints of pertinent information on the subject. It is planned to add to the brochure as additional articles of interest appear in the trade press or elsewhere. Four articles from The Oil & Gas Journal are included in the booklet.

Pipe-Line Firm Approved

A mixed government and private company, Soc. des Transports Petroliers par Pipeline, has been authorized by the French government to build and operate a pipe line from Le Havre to Paris. This line will carry products, and earlier reports said it would consist of 150 miles of 10 in.

ADVERTISERS

Air Reduction 59
Ajax Flexible Coupling Co., Inc. 153
Aluminum Co. of America 12
Amercoat Div. American Pipe & Construction Co. 17
American Cable Division of American Chain & Cable Co., Inc. Inside Back Cover
American Car & Foundry Company 62
American Iron & Machine Works ..... Back Cover
American Recording Chart Co. 176
Axelson Manufacturing Company 173
Baash-Ross Tool Company 110
Baker Oil Tools, Inc. 72
Baldwin-Duckworth Division of Chain Belt Company 68
Beech Aircraft Corp. 13
Boyd Co., Clarence L. 155
Briggs Bituminous Composition Co. 154
Cabot Shops, Inc. 34
Cameron Iron Works, Inc. 123
Cardwell Mfg. Co., Inc. 120, 121
Carter Company, Ralph B. 174
Cast Iron Pipe Research Association, The 140
Catawissa Valve & Fittings Company 127
Chevrolet Motor Div., General Motors Corp. 48
Chicago Bridge & Iron Company 83
Clark Brothers Company, Inc. 44, 45
Classified Advertising 186, 187, 188, 189
Combustion Engineering - Superheater, Inc. 28
Continental Electric Co., Inc. 134
Coody Bender Company, The 153
Core Laboratories, Inc. 33
Crose Manufacturing Co., Inc., M. J. 152
Davis Regulator Co. 153
Dean Brothers Pumps, Inc. 149
Dempster Brothers, Inc. 43
Dragon Mfg. Co. 158
Dresser Industries, Inc. 44, 45, 49, 118, 119
Dresser Manufacturing Division 49
Drilling & Service, Inc. 162
du Pont 1
Emerol Manufacturing Co., Inc. 159
Empire Machinery Co., Ltd. 113
Extruders, Inc. 158
Fairbanks, Morse & Co. 2
Fisher Governor Company 55
Floridin Company 140
Foster Wheeler Corp. 35, 36
Four Wheel Drive Auto Co., The 29
Fulton & Company, R. H. 150
Garrett Oil Tools, Inc. 126
Gaso Pump & Burner Mfg. Co. 53
Gates Rubber Co., The 65
General American Transportation Corporation 124, 125
General Electric Company 30, 31
Gill Company, J. B. 104
Goodall Rubber Company 8
Gorman-Rupp Company, The 172
Grancell, I. H. 157
Graver Tank & Mfg. Co., Inc. 67
Grove Regulator Co. 47
Guiberson Corporation 22
Harrisburg Steel Corporation 117
Hercules Tool Company 166
Hollingshead Corp., R. M. 169
Huey & Co., S. E. 154
Hughes Tool Co. ..... Front Cover
Industrial Instrument Co. 91
International Harvester Co. 88
International Nickel Company, Inc., The 70
Jenkins Bros. 25
Jones & Laughlin Supply Co. 32
Kellogg Co., The M. W. 142
Keuffel & Esser Co. 134
Klemp Company, Wm. F. 147
Koch Engineering Company, Inc., The 92
Landis Machine Co., The 11
Lane-Wells Co. 156
Larkin Packer Company, Inc. 116
Layne & Bowler, Inc. 60
Levingston Shipbuilding Co. 58
Link-Belt Company 5
Lunkenheimer Co., The 64
Macwhyte Co. 3
Manzel, Inc. 130
Marley Company, Inc., The 7
Mathey Machine Works, Inc., Frank 152
McCord Corporation 155
McKissick Products Corporation 131
McMurry, Paul 148
Mercoid Corp., The 186
Metal Goods Corporation 50
Michigan Power Shovel Company 167
Midwestern Engine & Equipment Co., Inc. 155
Mission Mfg. Co. 137, 139
Moore Corporation, Lee C. 164
National Airoil Burner Co., The 146
National Geophysical Company, Inc 160
National Transit Pump & Machine Co. 4
Nelson Electric Supply Co. 170
Nordstrom Valve Division, Rockwell Manufacturing Co. 9, 10
Oakite Products, Inc. 170
Oakite Inlector Co., The 6
Oil Center Tool Co. 40, 41
Oklahoma Contracting Co., Inc. 153
Oisco Mfg. Company 126
Otis Pressure Control, Inc. 63
Pacific Gear & Tool Works 171
Pacific Valves, Inc. 146
Page Fence Association 127
Paris Distributor, Inc., Henry H. 134
Parkersburg Machine Company 177
Patterson-Ballagh Division of Byron Jackson Co. 26
Peerless Pump Division of Food Machinery & Chemical Corp. 56
Penberthy Injector Co. 163
Perrault Bros., Inc. 154
Petro-Chem Development Co., Inc. 102
Petroleum Electric Power Assn. 18
Petroleum Rectifying Company 21
Pipeline Cleaners Co. 154
Powell Co., The Wm. 133
Pritchard & Co., J. F. 144
Padio Corporation of America 14, 15
Ratigan, J. P. 51
Raymond Concrete Pile Co. 39
Rector Well Equipment Co., Inc. 66, 177
Reed Roller Bit Company 114
Regan Forge & Engineering Co. 168
Reilly Tar & Chemical Corp. 155
Roebling's Sons Company, John A. 52
Security Engineering Co., Inc. 118, 119
Shamrock Hotel, The 174
Smith Corporation, A. O. 27
Southern Mill & Mfg. Co. 175
Spencer Chemical Company 145
Squier Co., John P. 149
Standard Pressed Steel Co. 158
Standco Brake Lining Co. 158
Sterling Machinery Corp. 148
Sunshine Iron Works 165
Templeton, Kenly & Co. 157
Texas Electric Steel Casting Co. 107
Thew Shovel Co., The 16
Thompson-Hayward Chemical Co. 149
Timken Roller Bearing Company, Steel & Tube Division 37
Tube-Turns, Inc. 24
Twin Disc Clutch Co. 46
Union Asbestos & Rubber Co. 129
United Centrifugal Pumps Division, United Iron Works Inside Front Cover
U. S. Steel Corp. Subsidiaries 159
United States Steel Supply Company 159
United Supply & Manufacturing Co. 42
Universal Oil Products Co. 87
Victor Products Corp. 147
Visco Products Co., Inc. 84
Vogt Machine Co., Henry 61
Walter Motor Truck Co. 38
Waukesha Motor Company 23
Western Gear Works 171
Western Supply Company 54
Wheat and Tube Company 57
Wheland Company, The 20
Williamson, Inc., T. D. 151
Wilson Manufacturing Co., Inc. 109
Wilson Oil Tools, Web 159
W-K-M Company, Inc. 19
Wood's Sons Co., T. B. 174
Wright Chemical Company 147

CALENDAR

August

United Nations Scientific Conference on the Conservation and Utilization of Resources, U. N. Interim Headquarters, Lake Success, N. Y., August 17-September 6.

September

Interstate Oil Compact Commission, summer quarterly meeting, Stanley Hotel, Estes Park, Colo., September 1-3.

American Institute of Chemical Engineers, Mt. Royal Hotel, Montreal, September 6-9.

Pacific Coast Gas Association, fifty-sixth annual convention, Santa Barbara, Calif., September 7-9.

Instrument Society of America, annual meeting and exhibit, Municipal Auditorium, St. Louis, September 12-16.

National Petroleum Association, Hotel Traymore, Atlantic City, N. J., September 14-16.

American Chemical Society, 116th national meeting, Atlantic City, N. J., September 18-23.

American Association of Oilwell Drilling Contractors, ninth annual meeting, Baker Hotel, Dallas, September 19-21.

National Butane-Propane Association, Jefferson Hotel, St. Louis, September 19-21.

Mid-Continent Oil and Gas Association, twenty-seventh annual convention, Louisiana-Arkansas division, Roosevelt Hotel, New Orleans, September 22-23.

American Institute of Mining and Metallurgical Engineers, regional meeting, Nell House, Columbus, Ohio, September 25-28.

American Society of Mechanical Engineers, fall meeting, Erie, Pa., September 29-30.

October

Independent Petroleum Association of America, Texas Hotel, Fort Worth, October 2-4.

American Society of Mechanical Engineers, petroleum division, 1949 Petroleum Mechanical Engineering Conference, Biltmore Hotel, Oklahoma City, October 2-5.

National Association of Corrosion Engineers, South-Central Regional Division, annual meeting, Adolphus Hotel, Dallas, October 3-4.

National Lubrication Grease Institute, Hotel Roosevelt, New Orleans, La., October 3-5.

American Institute of Mining & Metallurgical Engineers, Petroleum Branch, fall meeting, Plaza Hotel, San Antonio, October 5-7.

California Natural Gasoline Association, Ambassador Hotel, Los Angeles, October 7.

American Association of Petroleum Geologists, regional meeting, Buena Vista Hotel, Biloxi, Miss., October 12-14.

Symposium on Instrumentation for the Process Industries, fourth annual session, School of Engineering, Texas A. & M. College, College Station, Tex., October 12-14.

American Society for Testing Materials, first Pacific area national meeting, Hotel Fairmont, San Francisco, October 10.

Texas Mid-Continent Oil and Gas Association, annual meeting, Rice Hotel, Houston, October 13-14.

Oil Progress Week, October 16-22.

American Gas Association, annual convention, Chicago, October 17-20.

American Institute of Mining & Metallurgical Engineers, Petroleum Branch, fall meeting, Elk's Club, Los Angeles, October 20-21.

Independent Natural Gas Association of America, annual meeting, Baker Hotel, Dallas, October 31.

November

Society of Automotive Engineers, diesel, Chase Hotel, St. Louis, November 1-2.

Society of Automotive Engineers, fuels and lubricants, Chase Hotel, St. Louis, November 3-4.

American Petroleum Institute, annual meeting, Stevens Hotel, Chicago, November 7-10.

NOMADS

Houston Nomads, second Monday of each month, Ye Olde College Inn, Houston.

Los Angeles Nomads, second Wednesday each month, Jonathan Club.

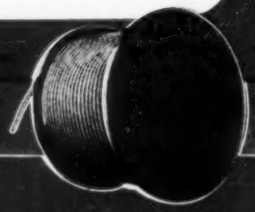
TABLE OF CONTENTS ON PAGE 71

This dramatic aerial photo shows the extent of drillers' quest for more oil.

The *BEST* Rotary Drilling Line is TRU-LAY *Preformed* in

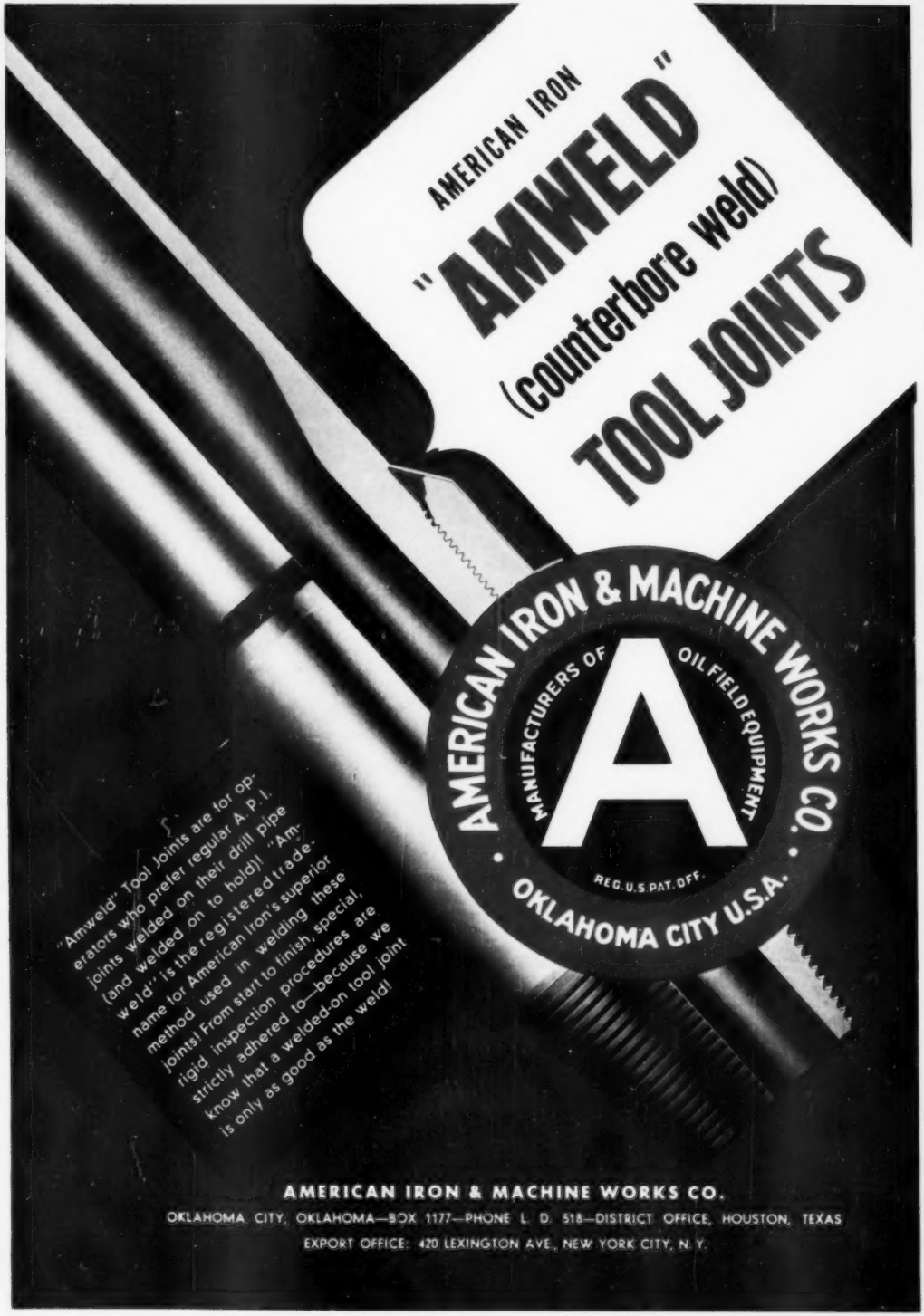
6 x 19 Seale Construction with Improved Plow Steel Wires and Independent Wire Rope Core

Ask your American Cable distributor for it—Say ***TRU-LAY!***



AMERICAN CABLE DIVISION
AMERICAN CHAIN & CABLE

In Business for Your Safety


AMERICAN IRON
"AMWELD"
(counterbore weld)
TOOL JOINTS
AMERICAN IRON & MACHINE WORKS CO.
MANUFACTURERS OF
OIL FIELD EQUIPMENT
A
REG. U.S. PAT. OFF.
OKLAHOMA CITY U.S.A.
"Amweld" Tool Joints are for operators who prefer regular A. P. I. joints welded on their drill pipe (and welded on to hold)! "Amweld" is the registered trade-name for American Iron's superior method used in welding these joints! From start to finish, special, rigid inspection procedures are strictly adhered to—because we know that a welded-on tool joint is only as good as the weld!

AMERICAN IRON & MACHINE WORKS CO.

OKLAHOMA CITY, OKLAHOMA—BOX 1177—PHONE L. D. 518—DISTRICT OFFICE, HOUSTON, TEXAS

EXPORT OFFICE: 420 LEXINGTON AVE., NEW YORK CITY, N. Y.